THE TAMING OF THE STEW:

HUMANS, REINDEER, CARIBOU AND FOOD SYSTEMS

ON THE SOUTHWESTERN SEWARD PENINSULA, ALASKA

By

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Abstract

This thesis addresses the question, *what is the role of reindeer within communities of Alaska's southwestern Seward Peninsula, particularly as a food source*? Employing a mixed-method approach, I conducted several months' fieldwork in the Seward Peninsula communities of Nome and Teller between 2016 and 2018, using methods that included participant observation, ethnographic interviews and a household survey designed to describe and quantify use of reindeer as food. As two varieties of the same species, *Rangifer tarandus*, reindeer and caribou are very similar in appearance. When caribou herds migrate nearby, reindeer tend to join them and become feral. Given the important role caribou played in Bering Straits Iñupiaq culture before their disappearance and the subsequent introduction of reindeer during the late 1800s, I contextualize the history of reindeer herding as part of a broader pattern of human-*Rangifer* relationships. During the past 30 years, reindeer herding has been disrupted by the return of migrating caribou to the region. Results from my fieldwork suggest that herding involves not only keeping reindeer separate from caribou, but also achieving community-level recognition of reindeer herds as domestic, privately owned and non-caribou. This is reflected in reindeer's role as a food source. Among Seward Peninsula Iñupiat, reindeer's gastronomic role is similar to that of caribou and other land mammals. Yet reindeer products can be monetarily exchanged in ways that caribou and other wild foods cannot. A further distinguishing feature of reindeer, as a domestic animal, is that it can be controlled and commodified while alive. As rural Alaskans seek to adapt their food systems to rapid social-ecological change, some have expressed renewed interest in reindeer herding. I conclude that herders must actively negotiate between views of reindeer herding as monetary and marketable, on the one hand, and as a food that embodies Iñupiaq values of generosity and (nonmonetary) sharing, on the other.

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Chapter 1: Introduction

The idea of *reindeer herding* refers not to a single phenomenon, but rather to a variety of associations between humans and domestic reindeer (*Rangifer tarandus tarandus*). In different reindeer herding systems, herders use reindeer for pulling sleds, riding, packing supplies, milking, meat production, velvet antler production, fur production, sacrifice, tourism among other uses (Ulvevadet and Klokov 2004). A general trait common to all reindeer herding systems is their close connection with food production. Even in small herds of domestic reindeer that are not typically slaughtered for food, a primary purpose is as transportation to facilitate hunting (Ingold 1980). However, relationships between reindeer, the food they produce and the people that herd them are far from straightforward. Historically, reindeer herding cultures have always depended on trade with surrounding groups for some of their food (Khazanov 1994), although in some cases they have been capable of subsisting for extended time periods on their own resources (Stammler 2005). The 20th century brought changes to the basic structure of reindeer herding communities, with inevitable implications for the cultural and economic significance of the food products of herding. While in the past, cultural groups involved in reindeer herding commonly consisted of extended family units living in the tundra (Ingold 1980), contemporary nomadic reindeer herders are based in permanent communities, the vast majority of whose inhabitants are not herders (Vitebsky 2005). In contrast to Khazanov's (1994) juxtaposition of nomadic groups and the "outside world"—the latter consisting of surrounding or neighboring socio-cultural structures—contemporary reindeer herders are anchored by communities that are neither nomadic nor really "outside." Insomuch as food production continues to drive modern

reindeer herding, scholarly attention should be given to the cultural and nutritional role of these food products in communities connected with herding.

In the Alaskan variety of reindeer herding, there is an especially close interconnection between herders and their surrounding communities. While many Siberian herders live on the tundra for much of the year, sometimes to the extent that they feel uncomfortable when they must travel to the settlements in which they are based (Anderson 2000; Vitebsky 2005; Stammler 2005), Alaskan herders live in villages or towns, making short trips to attend their herds in the tundra (Finstad et al. 2006, 37-38). Because their reindeer are frequently unattended, they are often somewhat more feral than those of more intensively-managed herds in Eurasia. Unfortunately, Alaska is often peripheral to anthropological discussions of Circumpolar reindeer herding, if it is even considered at all.

Not long before beginning this research, I had the opportunity to volunteer for an Alaskan reindeer herder who was attempting to round up some of his animals. This activity was a challenge for the herder and his assistants because reindeer were scattered across wide expanses of tundra and were difficult to control. While there, I became aware that the herder had a considerably different view of his herd and its significance than did some community members, who frequently traveled into the tundra to hunt for reindeer. Local tribal governments, who also owned part of the herd, permitted this hunting by its members. The herder disapproved of this, viewing his animals as privately owned and the open harvest as unsustainable in the long term. Some locals believed there were caribou in the adjoining mountains and talked about hunting them; the herder believed there were few to no caribou in the area that these animals were reindeer. Locals also described obtaining reindeer in a way that did not differ significantly from caribou hunting. I personally observed this after the herder gave his cousin, who was assisting

with the herding, his approval to shoot a reindeer that we saw in the tundra. Before skinning and gutting the animal, the cousin gave the reindeer a last drink by pouring water into its mouth—a traditional way Yup'ik hunters show respect for the animals they have killed. The only things I noticed that distinguished this as a domestic reindeer harvest were the approval the herder gave his cousin and the tag in the animal's ear, whose color indicated that this particular animal belonged to one of the local tribes. As the cousin cut the tag from the ear, the herder told him, "bring this tag to them [the tribal government] and tell 'em you earned it."

Reindeer herding in Alaska has a relatively short history, and has never been a primary occupation of any large, cohesive group (e.g. a traditional Iñupiaq society or settled community). Rather, it has been practiced mainly by a scattering of individual herders and families within Iñupiaq, Saint Lawrence Island Yupik, Central Yup'ik, Ungalik cultures, among other groups in rural Alaska. The broader cultural frameworks of these groups continue to emphasize "subsistence" food production activities: hunting, fishing, berry-picking and plant-gathering (Simon 1998).[1] An overwhelming majority of the food consumed in western Alaska is either obtained in this way or imported from outside the region. Locally-cultivated foods account for a very small fraction of the food in western Alaska (and in Alaska as a whole), notwithstanding a recent uptick of interest in rural Alaska gardening and agricultural projects (Snyder and Meter

[1] In Alaska, the term "subsistence" typically refers to hunting, fishing, berry picking and plant/fungus gathering for the purpose of obtaining food, particularly in rural and/or Alaska Native contexts. It also has various legal definitions among different government agencies and is highly politicized, particularly in light of the legal history associated with the Alaska National Interest Lands Conservation Act (ANILCA) (Kancewick and Smith 1990). Although it is widely used, I have heard both Alaska Native people and nonnative Alaskans express distaste for it on occasion. In other anthropological literature on the Circumpolar North, the term is often used to refer to food production that is nonmonetized and/or primarily for local use, and can include pastoralism, agriculture, etc. Where I use *subsistence* in this thesis, I am referring specifically to hunting, fishing, gathering and/or the products of these activities—unless otherwise noted. As I will show, reindeer herding occupies something of a gray area between "subsistence" and "agriculture." In 4.2.3 I discuss local perceptions of this term and other food-related concepts.

2015). The products of reindeer herding are commonly categorized as cultivated food: US law considers reindeer to be domestic mammals (Bader and Finstad 2001, 557). However, reindeer are far more closely related to wild caribou (*Rangifer tarandus granttii*) than they are to any other livestock animal. Because Alaskan reindeer herding occurs against a cultural backdrop that is oriented toward hunting animals such as caribou, this raises the question of how members of the broader communities in which herding takes place relate to reindeer. This is especially relevant on the western Seward Peninsula, where caribou have reappeared in the region, but where reindeer herding persists in several communities. More broadly, as discourse on food security and local food cultivation has gained increasing prominence in rural Alaska, reindeer herding offers a compelling case study of the relationship between wild and cultivated foods. As I will demonstrate in this thesis, domestic reindeer can functionally play a variety of roles ranging from domestic livestock to de facto wild animals.

1.1 Research questions

This thesis' primary research question is:

- What is the role of reindeer within communities of the southwestern Seward Peninsula, particularly as a food source?

In order to guide exploration of this primary question, I have developed five sub-questions:

a. What are the general patterns of interaction between humans, reindeer and caribou, and how have these developed over time?

b. How are reindeer constructed as a wild/domestic animal within local communities?

c. What are the general patterns of acquisition, exchange and use of reindeer products?

d. How does the social role of reindeer as a food source compare to that of caribou and other wild food sources?

e. How have changing relationships to food in rural Alaska influenced the way reindeer herding is conceptualized?

These questions seek to explore the intersection of reindeer herding, communities and food. In order to address them, I will examine the historical development of relationships between humans, reindeer and caribou on the western Seward Peninsula, and the variety of interaction patterns between members of study communities and reindeer/caribou. I will also consider the role of reindeer within local food systems—and in particular, its relationship to caribou and other non-cultivated food products.

Throughout this thesis, I use the term *human*-Rangifer *systems* to refer to the network of social and ecological relationships emanating from human interaction with reindeer/caribou. This refers to the variety of intersections between humans' lives and those of reindeer/caribou, including hunting/herding practices, cultural institutions governing these practices, food production, human relations to predators, etc. At the end of this chapter (in section 1.6 Summary, propositions and thesis overview), I present a graphic model of human-*Rangifer* systems as I describe them in this thesis.

1.2 The setting

This thesis is mainly concerned with the communities of Nome and Teller, both of which are located on the southwestern part of the Seward Peninsula, a 20,000-square mile landmass in western Alaska, just south of the Arctic Circle. The peninsula is surrounded by the Bering Sea in the south and the Chukchi Sea in the north; both Nome and Teller sit on the shores of the Bering Sea or adjacent estuarial waters. To the west, across the 55-mile Bering Strait, lies the Chukotka Peninsula, the easternmost promontory of the Asian continent. The Seward Peninsula's northern littoral consists of an expansive coastal plain, while further to the south, broad river valleys congeal into veins, fed by hills and mountains of moderate height (generally 2,000-3,000 feet). Alder and willow stipple the wet, permafrost-laden tundra that dominates much of the peninsula's landscape. These shrub-covered areas are expanding dramatically with the rapidly warming climate in the region. Similarly, a spruce-dominated boreal forest has gradually expanded its range over the past century, and currently covers large, intermittent swaths of the southeastern Seward Peninsula (Lloyd et al. 2002). Areas of cottonwood forest can be found in inland valleys as far west as the middle Kuzitrin River valley north of Nome. The area's climate is a maritime arctic one, characterized by cool, short summers; cold, very long winters; low precipitation; and frequent winds. Inland, the climate is somewhat more continental: winters are colder but slightly shorter, while summer temperatures can get much warmer. However, climatic conditions are changing rapidly. In recent years, the region has seen milder, much shorter winters and more unpredictable weather patterns. In the past, the northern Bering Sea has generally been frozen between November and June, but sea-ice in recent years has been very late-forming and discontinuous (International Arctic Research Center 2018).

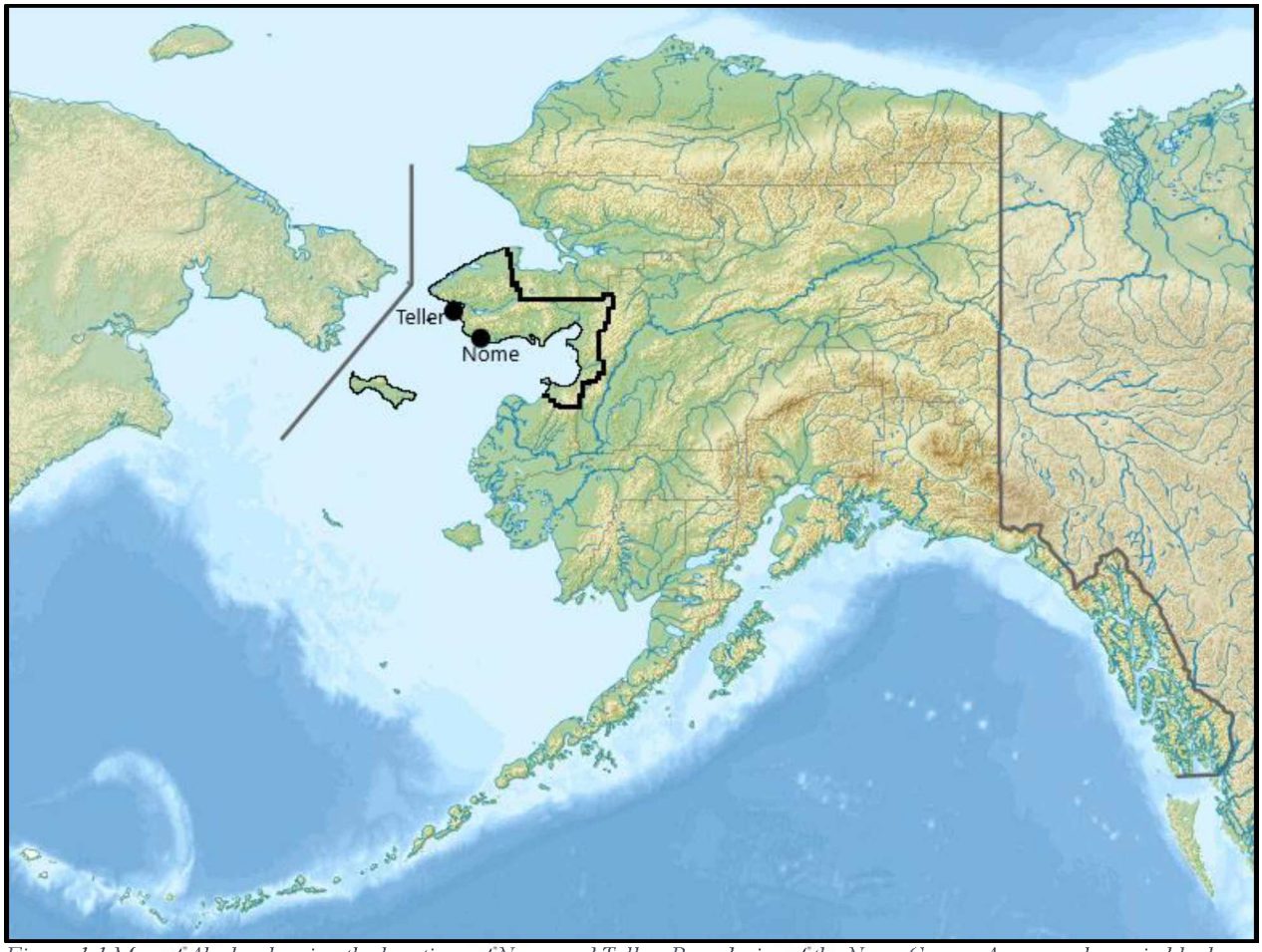

Figure 1.1 Map of Alaska showing the locations of Nome and Teller. Boundaries of the Nome Census Area are shown in black. Map source © Nzeemin [CC BY-SA 3.0 (https://creativecommons.org/licenses/by-sa/3.0)]

The Indigenous inhabitants of the Nome-Teller area are the Bering Straits Iñupiaq people, although broader region is also the homeland of Ungalik, Kobuk Valley Iñupiaq and Saint Lawrence Island Yupik inhabitants. (See chapter 2 for more detailed overview of the people from the Nome-Teller area).

Nome has become the Bering Straits region's cultural and economic hub (pop. 3,691; Alaska Department of Commerce 2017), and its population includes many who originally came from outlying communities. As well, Nome has a much larger percentage of nonnative inhabitants than anywhere else in the region due to its status as a hub community and its history

as a gold-mining settlement. A far greater variety of goods and services are available in Nome than anywhere else in the region.

Teller, or Tala (Iñupiaq), is located on the shores of Port Clarence, 80 miles to the northwest of Nome. It is connected to Nome by a road that is open during the snow-free months (typically May or June through October). Teller's population is estimated at 251, of which 94% identify as Iñupiaq (Alaska Department of Commerce 2017). Like Nome, Teller began its modern history as a gold-mining outpost. Its inhabitants trace their roots mainly to the nearby Port Clarence and Kuzitrin River areas, although Teller also has families that originated in places such as Shishmaref, Diomede and Point Hope. The nearest neighboring community, Brevig Mission, is located just six miles to the north across Port Clarence.

Figure 1.2: Nome. Photo by Odin Miller.

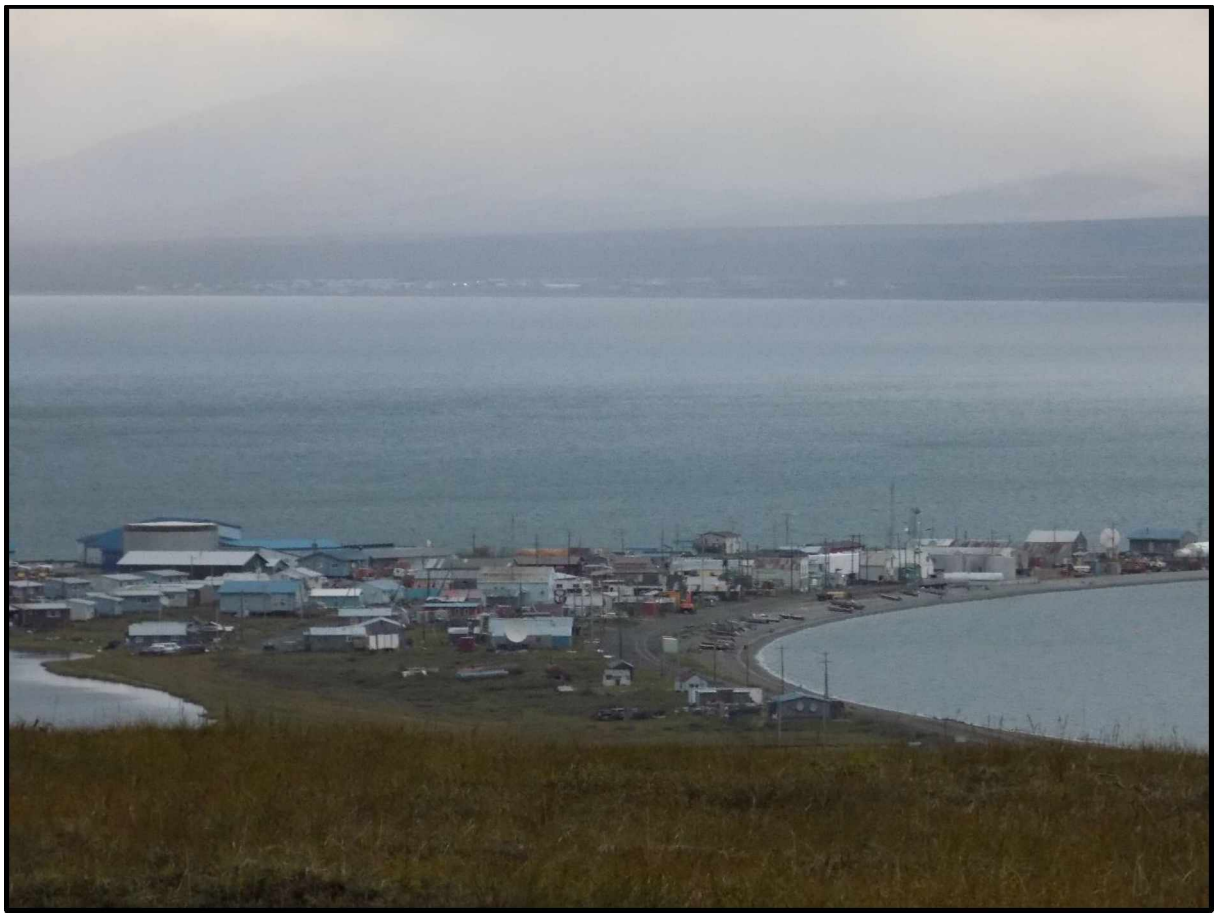

Figure 1.3: Teller. Photo by Odin Miller.

1.3. Literature review

1.3.1 Reindeer herding and food production in Alaska and the Circumpolar North

Reindeer herding has been a popular subject in cultural anthropological studies of the Circumpolar North since the early 1900s, the focus of lively debates around theoretical topics such as reindeer domestication (Beach and Stammler 2006, 11). Most reindeer-herding cultures are located in present-day Russia. Because of the Cold War, Soviet ethnography and western anthropology developed in relative isolation from each other during much of the 20th century (Krupnik 1993, 11-17), with the latter most often based on fieldwork among the Sámi reindeer herders of Fennoscandia (e.g. Paine 1994; Ingold 1980; Pelto 1973). The end of the Cold War

opened studies of reindeer herding to a more truly Circumpolar perspective, resulting in such influential works as Hugh Beach's (1990) "Comparative Systems of Reindeer Herding," Igor Krupnik's (1993) *Arctic Adaptations*, Beach's and Florien Stammler's (2006) "Human-Animal Relations in Pastoralism," David Anderson's (2000) *Identity and Ecology in Arctic Siberia* and Piers Vitebsky's (2005) *Reindeer People*. The first three are comparative/theoretical works while the latter two are ethnographies of Siberian reindeer herding.

Alaska tends to be underrepresented in the anthropological conversation on reindeer herding. To some extent, this is probably because Alaskan reindeer herding is a relatively recent phenomenon, and thus is not seen as relevant to works tracing the origins and development of pastoral societies (e.g. Ingold 1980; Krupnik 1993; Khazanov 1994). Comparative works situated in the ethnographic present sometimes include Alaska (e.g. Anderson 1959; Beach 1990; Koskey 2003), and a steady trickle of ethnographies and ethnohistories (some by natural scientists as well as anthropologists) have focused on reindeer herders (e.g. Lantis 1950; Beach 1985; Olson 1969; Stern et al. 1980; Beach 1985; Simon 1998; Ellanna and Sherrod 2004; Schneider et al. 2005; Finstad et al. 2006; Rattenbury et al. 2009; Mager 2012). The "Reindeer Herding" compilation of oral interviews contained on UAF's Project Jukebox website (http://jukebox.uaf.edu/reindherding) also provides an excellent collection of oral interviews with reindeer herders in Alaska, which I reference frequently in chapter 2 and throughout this thesis. More broadly, biologists, missionaries, educators, government agents and others have produced massive amounts of literature on Alaskan reindeer herding. Combined, there is a broad range of sources to choose from on an array of reindeer-related topics, including human-reindeer-caribou relations in Alaska, a major focus of this thesis (Burch 2012; Ellanna and Sherrod 2004; Beach 1985; Mager 2012; Plattet and Lincoln 2014; Colson et al. 2014; Carlson

2005; Wolfe and Pete 1984). Much of this scholarship has been contributed by Alaska-based researchers.

Naturally, reindeer herding ethnographies tend to follow herders as the primary human actors, whether they are navigating monetary economies, government agencies, their own cultures' social expectations, or managing the ecological pressures of tundra landscapes. Because of this, these ethnographies seldom include substantive discussions of the role of reindeer products in surrounding communities. I have found this to be true of literature on both Alaska and the Circumpolar North more broadly. At times, the village is little more than a passive backdrop. Even community ethnographies with discussions of reindeer herding tend to discuss production rather than consumption (e.g. Kerttula 2000).

Buried in this cannon of literature on Alaska reindeer herding are some fleeting discussions of local reindeer use. These frequently appear in the ethnohistorical chronicles of the events surrounding reindeer introduction to Alaska at the end of the 19th century. Major topics include the question of famine conditions in Northwest Alaska during the late 19th century (Ray 1975; Burch 1975; Burch 2012), and Iñupiaq access to reindeer products during the early reindeer years (Ellanna and Sherrod 2004; Simon 1998; Stern et al. 1980). I discuss these briefly in chapter 2 for historical context, although the focus of my thesis is primarily on the present and recent past (1960s-2010s).

Olson (1969) devotes a chapter to social-economic relations between herders and other village residents ("The Village Orientation," 113-123), although his primary concern relates to reindeer herders as managers and economic producers. Here, he describes herders' need to balance herd growth and profitability (which was limited at that time by the lack of markets) against the Iñupiaq value of generosity in sharing. Interestingly, he notes herders' begrudging

tolerance of unauthorized reindeer hunting as per these social values, suggesting that "poaching is an inappropriate term for use among the Eskimo" (Olson 1969, 119).

In their discussion of reindeer industry economics, Stern et al. (1980, 127-137) outline the general features of meat production and consumption patterns on the Seward Peninsula. For instance, they provide estimates of the quantities of reindeer meat paid as wages in exchange for labor, sold by herders directly to village residents, and sold to grocery stores for purchase by residents. They also discuss its price and availability to consumers. While their consideration provides a valuable perspective on the magnitude and availability of reindeer as a local food product at that time, it provides very little in the way of social or ethnographic detail. The title of the chapter in which it appears, "Marketing of Reindeer Products," indicates its concern.

Simon (1998, 281-94) devotes a chapter to the contemporaneous role of reindeer herding within the community of Shishmaref, but concludes that its significance within Iñupiaq cultural heritage is more important than its contribution to the community's food or economy. Because of this, he focuses his discussion on its cultural role, after a brief outline of its role in Shishmaref's foodways:

> One point that should have become clear was that reindeer meat is a village staple, except for those who can afford to buy commercial beef at extremely high prices, or those who travel to the east to hunt caribou and transport it back to Shishmaref. While moose hunting features in Shishmaref area subsistence, the species fails to compete with the productivity of caribou and reindeer. Furthermore some elders do not care for moose meat, and therefore moose can hardly replace the customary desire for reindeer or caribou meat. Because only two Shishmaref families own herds, however, the majority of the

> Shishmaref community must purchase reindeer meat as they can not [sic] produce it themselves (Simon 1998: 280).

The ethnohistory that forms the bulk of Simon's dissertation makes occasional mention of reindeer's role in local food systems, although this is by no means a major focus. However, he does emphasize the historical continuity of the *umialik* role (an Iñupiaq social status characterized by wealth and generosity) in reindeer herding, and the cultural importance of the sharing of food and other wealth by reindeer *umialit*.

1.3.2 Community food systems in contemporary Alaska

There is voluminous literature on community-level food systems and food security in Alaska and elsewhere in the Circumpolar North. This includes a plethora of topics connected to subsistence food systems: their resilience to global social and ecological change (Kofinas et al. 2010; Brinkman 2014; Baggio et al. 2016), their role in shaping household-level food security in the North (Collings 2011; Titus et al. 2009), intakes of nutrients (Bersamin et al. 2007; Kuhnlein et al. 2009) and environmental contaminants (Garry et al. 2017) from consuming wild food, etc. In Alaska, both popular and academic discourse have seen increasing concern with the food security challenges associated with reliance on imported food and its lengthy supply chains (Donovan and Snyder 2013; Snyder and Meter 2015). Rural Alaska's remoteness compounds this problem, as does the high price and low quality of store foods there. Loring and Gerlach (2009) have attempted to develop a holistic, health-based way of modeling rural Alaska's food systems. These food security challenges have driven increased interest in food cultivation projects in rural Alaska—among them, reindeer herding (Reedy 2016). However, discussions of

reindeer are relatively sparse among these various threads of literature on rural Alaska food systems.

The largest and most longitudinal set of quantitative subsistence use data is probably the Department of Fish and Game (ADF&G), Division of Subsistence technical paper (TP) and special publications (SP) series. This is a series of gray papers that generally seeks to quantify and otherwise document subsistence harvests, uses and practices in rural Alaska. Some of these papers include ethnographic detail, although their orientation is mostly quantitative, and ideological frameworks sometimes constrain their inquiry and analysis to state-sanctioned priorities rather than local ones. A few TPs include discussions of reindeer. Wolfe and Pete (1984) quantify use of caribou and reindeer hunted in the Andreafsky Mountains by residents of neighboring communities, including the reindeer-herding village of Stebbins. Their discussion highlights some of the local disagreements surrounding reindeer/caribou identification (Wolfe and Pete 1984, 9-11). More recently, Braem et al. (2017; 224-225; 231) have also included a brief discussion of reindeer use in Stebbins in their chapter on harvest and use of wild food in that community.[2] Yet for the most part, recent TPs have avoided quantifying or discussing domestic reindeer due to its legal status as domestic, and thus not legally considered subsistence. In fact, a recent study of wildlife harvests on the Seward Peninsula (Mikow et al. 2018) indiscriminately reports "caribou" harvest for Teller in an area that both biologists and locals agree to be used only by reindeer. This renders their data inconsistent with Teller harvest data reported in past TPs, which document very low levels of caribou harvest (for further discussion of this, see section 3.3.1: Western Arctic Caribou Herd).

[2] While employed by ADF&G Subsistence between 2013 and 2015, I collected data for this project, among others.

A 2007 project undertaken by Kawerak, Inc. quantified resource use in nine Bering Straits communities, including Teller, using comprehensive survey methodology very similar to that of ADF&G Subsistence (Ahmasuk et al. 2008). The project included reindeer harvest for Savoonga, explaining that the community "harvests locally owned reindeer for subsistence" (Ahmasuk et al. 2008, 107). It does not provide ethnographic detail on reindeer use, however; nor does it quantify reindeer use in Teller.

The most thorough treatment of reindeer as a community food source is probably Reedy's (2016) political ecology study, which documents the role of large land mammals in shaping food security among inhabitants of the Alaska Peninsula and Aleutian Islands. Reedy argues that reindeer, and other introduced land mammal species, play a critical role in shaping household food security in a region characterized by fluctuating maritime food sources and expensive, unreliable store food. Federal land managers have labeled these introduced species as "invasive" and have at various times sought to eliminate them, often showing little concern for local perceptions, values or food security:

> Despite refuge managers' call to shift "how Alaskans should think" about these animals, non-native species are conceived of locally as Native food. They have been fixtures for several generations of Aleut users, the animals are eating and drinking the resources of the Aleutian lands to take on Aleutian flavors, and they are supporting families (Reedy 2016:16).

Reedy also discusses the feral reindeer herd at Atka and the recent reindeer introduction project at Port Heiden. While her study employs a comprehensive survey methodology similar to that

employed in the ADF&G TP's, the approach is more holistic, including nonnative species such as reindeer, cattle, sheep and bison in its quantification of community food use.

Plattet and Lincoln (2014) likewise discuss the contemporary Alaska Peninsula, situating locals' "taste" for *Rangifer* within the historical memories of reindeer herding there during the early 20th century. Residents are able to identify and describe reindeer descendants within the Alaska Peninsula caribou herds, which in some cases exhibit behavior that is quite tame. Although her primary concern is not food, Mager (2012) similarly describes local recognition of reindeer-like animals within North Slope caribou herds.

The 2008 volume *Arctic Food Security* contains two chapters that consider the role of reindeer in the food systems of arctic communities. Müller-Wille et al. (2008) argue that Sámi food security is intertwined with reindeer herding, which is very land-intensive. As such, they assert that the fragmentation of reindeer pastures to nonnative inmigration, development, etc., presents a direct threat to community food security. Their study uses interview methodology to gauge household food security in a Finnish Sámi village, giving an overview of the various local food sources. Tuisku (2008, 280) outlines the availability and circulation of reindeer and other food sources in a Nenets village in the Russian Arctic, pointing out that emic concepts of food differ from those commonly used by researchers: "[…] people do not categorize food as wild or country food *versus* imported food, but as traditional *versus* modern food. Traditional refers to 'what we always have eaten, or what food we ate when we were children,' which includes both locally produced and imported food" (emphasis in original).

1.4 Theory

1.4.1 Ambiguities of reindeer: wildness versus domestication

Ingold (2000) contrasts traditions of herding, characterized by human domination and ownership of animals, with those of hunting, in which human-animals relationships are defined by trust. He notes that both relationships may occur within the same cultural environment (Ingold 2000, 422, note 7). This has sparked a lively debate within cultural anthropology, with some scholars taking the opposite position of hunting as domination and herding as trust (e.g. Knight 2012). Nevertheless, Ingold's framework seems to align with how the literature portrays Iñupiaq worldviews during the early colonial period. Ellanna and Sherrod (2004, 180) suggest that early-20th century Bering Straits Iñupiat regarded reindeer, like domestic dogs, as subservient to humans: "By becoming tame, the reindeer lost the autonomy and self-sufficiency of the caribou." Simon (1998, 180-182) also notes the same parallel between reindeer and dogs.

While Donahoe (2012) generally accepts Ingold's characterization, he argues that South Siberian Tozhu reindeer herders afford their animals a unique status that is characterized by trust as much as by domination: "They have a special status that lies somewhere between wild animals and domesticated livestock, and are still accorded the respect shown to wild animals" (Donahoe 2012, 100). An important component of Ingold's theorization is that hunters respect the autonomy of wild animals. Donahoe asserts that in many ways, Tozhu herders *do* respect the autonomy of their reindeer.

Reindeer herding in Alaska is of course vastly different than that of the Tozhu; perhaps it could more easily fit into Ingold's (2000) typology as a form of "domination" by the herder over the herd. Moreover, human relations to the landscape are quite different among the Tozhu (Arakchaa 2018) than among the Iñupiat (Ellanna and Sherrod 2004). Yet it is interesting that

among traits that make the animals "wild animal-like," Donahoe (2012, 100) also cites general behavioral characteristics, rooted in biology: "Reindeer [...] are independent by nature, can defend themselves, and do not rely on humans for food. [...] In the dead of winter, the herds are frequently left to forage for themselves, with the herders tracking them down once or twice a week to know where they are" (Donahoe 2012, 110). These traits would be readily seen in Alaska and among reindeer herding cultures throughout the North, as would Donahoe's observation that, "if not properly looked after, reindeer will turn feral. [...] They are of the land and can return there at any time. Neither are they dependent on the herder, who in turn is well aware of this" (Donahoe 2012, 110).

I suggest that a key trait of reindeer is in the versatility and ambiguity of their social roles within the cultural milieu of Alaska. The wild animal-like traits that Donahoe describes have contributed to the versatility of domestic reindeer, as well as to the cultural and economic resilience of reindeer herding. One of the reasons reindeer herding did not disappear during periods of social-cultural upheaval like the 1918 flu epidemic (Stern et al. 1980, 44) is likely because reindeer are perfectly capable of surviving without constant monitoring.

Yet we can implicate these same qualities in disruptions and vulnerabilities to herding over the years. As Donahoe points out in the above quote, reindeer can easily become feral. If the herder does not periodically re-create the relationship of dominance over the animals, they begin to behave increasingly as autonomous wild animals. This is particularly problematic when there are wild caribou herds in the same environment, as they tend to "recruit" the domestic reindeer into following their migration. Although there are general biogenetic differences between the two varieties of *Rangifer tarandus* found in Alaska, reflecting the two populations' historic isolation from each other, these differences are not significant enough to prevent reindeer

(*Rangifer tarandus tarandus*) and caribou (*Rangifer tarandus granti*) from fully intermixing when in the same environment. In Alaska, recent genetic evidence suggests that individuals in some Alaska caribou herds contain reindeer DNA, despite the fact that herding discontinued in some of those areas more than 70 years ago (Colson et al. 2014). Hunters in various parts of western Alaska have observed that some animals exhibit reindeer-like behaviors and/or physical characteristics (Mager 2012; Plattet and Lincoln 2014).

The only thing normally preventing the two varieties of *Rangifer tarandus* from intermixing is geographic separation. In Alaska, some herders have tried to impose separation on their herds to prevent them from following caribou migrations: for several years, White Mountain herder Tom Gray (2002; 2016) kept his reindeer on an isolated peninsula where caribou had not been migrating. Herders have also tried to prevent caribou recruitment through intensive management intended to tame their animals (i.e. asserting their dominance over the animals, in Ingold's 2000 formulation), but in Alaska this has often been unsuccessful, as Shaktoolik herder Palmer Sagoonick (2003) describes:

> I thought I had 'em so domesticated that, when the caribou come though, they would stay. But I was wrong. Being with the animals every day they got so tame, that I could almost touch 'em when I was herding 'em. And I thought if I did that, even if the caribou came through, if I whistled or hollered, they would come back. But their instinct to be a herd animal is greater than all the years I've worked them and corralled them and protected them.

Domestication of reindeer is tentative, even in the intensive pastoral traditions of the northern Asian forest (Vitebsky 2005; Stépanoff 2012). While herders must continually re-create

the relationship of dominance over the animals, caribou have a more powerful and immediate influence on reindeer in re-creating the relationship of autonomy. In this sense, the notion of domestic reindeer as a particular category of *Rangifer* is a human construct, a differentiation that countervails the behavioral tendency of the animals themselves toward integration (through joint migration, interbreeding, etc.) when in the same environment. This is not to say that there are no biological differences: both Indigenous knowledge (e.g. Stalker 2001) and western science (Skoog 1968) would agree that there are. Rather, it is to say humans have imposed the separation of domestic reindeer from their wild cousins, and that it is human intervention that continues to keep these two categories of *Rangifer* separate from each other despite their natural tendency toward intermixing.

Reindeer's ambiguity in its ecological relationship with humans—at least in Alaska—is mirrored by a comparable ambiguity of reindeer within human cultural and economic systems. On the one hand, the difference between wild and domestic *Rangifer* enjoys widespread recognition across cultures of the Eurasian North. Beach and Stammler (2006, 10) have pointed out that all reindeer herding cultures have different terms for wild and domestic *Rangifer*. On Alaska's Seward Peninsula, many of the participants in this research have described being able to differentiate reindeer from caribou (see chapter 3).

Nevertheless, reindeer-caribou ambiguity is a social reality on today's Seward Peninsula. Despite widespread local knowledge of *Rangifer* differentiation, particularly among Iñupiaq hunters, such knowledge is not universal, and so cannot be assumed to be *obvious*. Because it is not necessarily accepted as an obvious truth, it is sometimes negotiated and contested along ideological lines that reflect differing economic interests. In general, a key economic interest of reindeer herders is to assert ownership over their animals, and in doing so, to control access to

them. Ear-tags and ear-notches accomplish this by removing the animals' interpretive ambiguity and marking them as property. On the other hand, economic interests of those not involved in herding may vary considerably, influenced by factors such as their social positions and relationships with reindeer owners. Wolfe and Pete (1984, 9) document "disagreement among local hunters as to whether the herds at the headwaters of the Andreafsky River are caribou, mixed caribou-reindeer, feral reindeer, or domestic reindeer which are part of the reindeer stock belonging to the community of Stebbins." They report that Stebbins residents believed many of the animals to be part of the community's reindeer herd, while hunters from other communities reported a variety of opinions about their identification.

Rangifer identification also has legal implications that influence not only the proprietary status of the animals but also the kinds of economic exchange in which they can be used. According to Bader and Finstad (2001, 557), "Caribou are wildlife, and therefore, are subject to the ancient common law doctrine of *ferae naturae*. An animal *ferae naturae* cannot be owned by any individual." Legally, regulation of caribou harvest is mediated by the US Federal Government and State of Alaska; in practice, local management initiatives are also significant. Reindeer are defined as free-ranging livestock as long as they maintain their domestic status, in which case their owner has legal control over their harvest (Bader and Finstad 2001, 558) Yet here, too, there is ample room for ambiguity in the identification and status of reindeer. As Plattet and Lincoln (2014, 5) explain:

> According to the Alaska Administrative Code (5 AAC 92.029 (d)(2)(C–D)), reindeer that leave state or federal leased rangelands are considered feral and presumed to be game. Thus, depending on the land it grazes on, a reindeer "turns into" a caribou unless a clear

identifier is retained (permanent brand, ear tag, owner's mark). Accordingly, neither federal nor state laws account for mixed caribou-reindeer animals and their descendants.

Citing Beach (1985), Plattet and Lincoln (2014, 5) also point out that Reindeer Act[3] definition allows for caribou that have been kept as domestic animals to be legally considered "reindeer" in certain, vaguely-defined circumstances.

1.4.2 "Sentient commodity" and "Native food"

The act of legally defining an animal as a "reindeer" versus a "caribou" has implications for its potential role as food. Commercial sale of wild animals such as caribou is prohibited under federal law; by contrast, reindeer can be sold at grocery stores or served at restaurants (Alaska Division of Natural Resources 2014). In practice, this does not mean that reindeer are always sold or that caribou are never sold. To the contrary, managed domestic reindeer are very commonly distributed via generalized reciprocity, while in practice there is some monetary trade of caribou among local and regional networks in Alaska (Fall 2016, 51). Nevertheless, legal "wildness" versus "domesticity" influences *how* the animal can be traded or sold.

Here, it is useful to consider Arjun Appadurai's (1986) framework on the process of commodification (as well as the related one proposed by Igor Kopytoff 1986). Rather than defining commodities as a certain type or class of thing, Appadurai conceptualizes commodification as being defined by the kind of relationship people have toward things. He suggests that "the commodity situation in the social life of any 'thing' be defined as the situation

[3] The 1937 Reindeer Act is a US federal law with provisions that originally stipulated that only Alaska Native people could own reindeer (Ellanna and Sherrod 2004:108-111). It also excluded reindeer from the agricultural subsidies that cattle producers receive.

in which its exchangeability (past, present, or future) for some other thing is its socially relevant feature." (Appadurai 1986, 13). As such, commodities are not restricted to items circulated through markets. Things have degrees of "commodity candidacy" depending on "the standards and criteria (symbolic, classificatory and moral) that define the exchangeability of things in any particular social and historical context" (Appadurai 1986, 14).

Under Appadurai's framework, then, live *Rangifer* defined as "wild" (under whatever cultural or legal framework) would not be eligible for commodification (without first changing their "wild" status) because they are not socially accepted as property and cannot be exchanged. On the other hand, *Rangifer* defined as "domestic" *could* be considered commodities. "Feral" reindeer would be non-commodities, but if ownership over them were reasserted, theoretically they could be recommodified. As with other traits of reindeer, their commodity status as live animals is often more ambiguous than those of caribou or purely domestic stock (e.g. sheep, cattle).

In her discussion of commercial and hobby livestock producers in Scotland, sociologist Rhoda Wilkie (2005) applies Kopytoff's (1986) commodity conceptualization to human-livestock relations, quoting a passage from the beginning of his essay that bears repeating:

> [...] the production of commodities is also [...] a cultural and cognitive process: commodities must be not only produced materially as things, but also culturally marked as being a certain kind of thing. [...] Moreover, the same things may be treated as a commodity at one time and not at another. And finally, the same thing may, at the same time, be seen as a commodity by one person and as something else by another. Such shifts and differences in whether and when a thing is a commodity reveal a moral

> economy that stands behind the objective economy of visible transactions (Kopytoff 1986, 64).

Wilkie (2005, 224) argues that livestock become de-commodified and recommodified throughout their lifetimes, based on the dynamics of their relationships with individual humans. For example, even animals adopted by hobby farmers as "pets" and removed from commodity circulation may be recommodified and sold for slaughter if finances become tight.

Although the patterns of human-animal relationships in Alaskan reindeer herding are quite different than those Wilkie describes of Scotland, her conceptualization of livestock de-commodification and recommodification is useful. In Alaska, I would suggest that *Rangifer* become de-commodified to the extent that they are regarded as wild animals: because they are neither owned nor controlled, they have no exchange value. By contrast, asserting dominance or ownership over them, such as through corralling, is part of the process of re-commodification. Corralling is expensive, so livestock owners undertaking it are typically under some economic pressure to obtain exchange value from their animals, whether at the time of the corralling or at a future date. Stray caribou are commonly separated during corrallings (Bader and Finstad 2001, 553), making the herds easier to control and predict. Reindeer ear-tags, attached to the animals during corralling, are significant symbols of commodification. They visibly mark the ownership of domestic reindeer, disambiguating them from both caribou, and from reindeer belonging to other owners. Ear-tags also provide information that herders use in deciding how to appropriate their animals, often on the basis of management principles designed to optimize yields. Large red tags used to mark animals for slaughter are even clearer symbols of commodification (figure 1.4, below). By contrast, an owner seeking to slaughter animals from a relatively untamed herd in the

tundra would usually not have the ability to select precisely certain members of the population; thus, none would be individually commodified unless and until their harvested products were later exchanged.

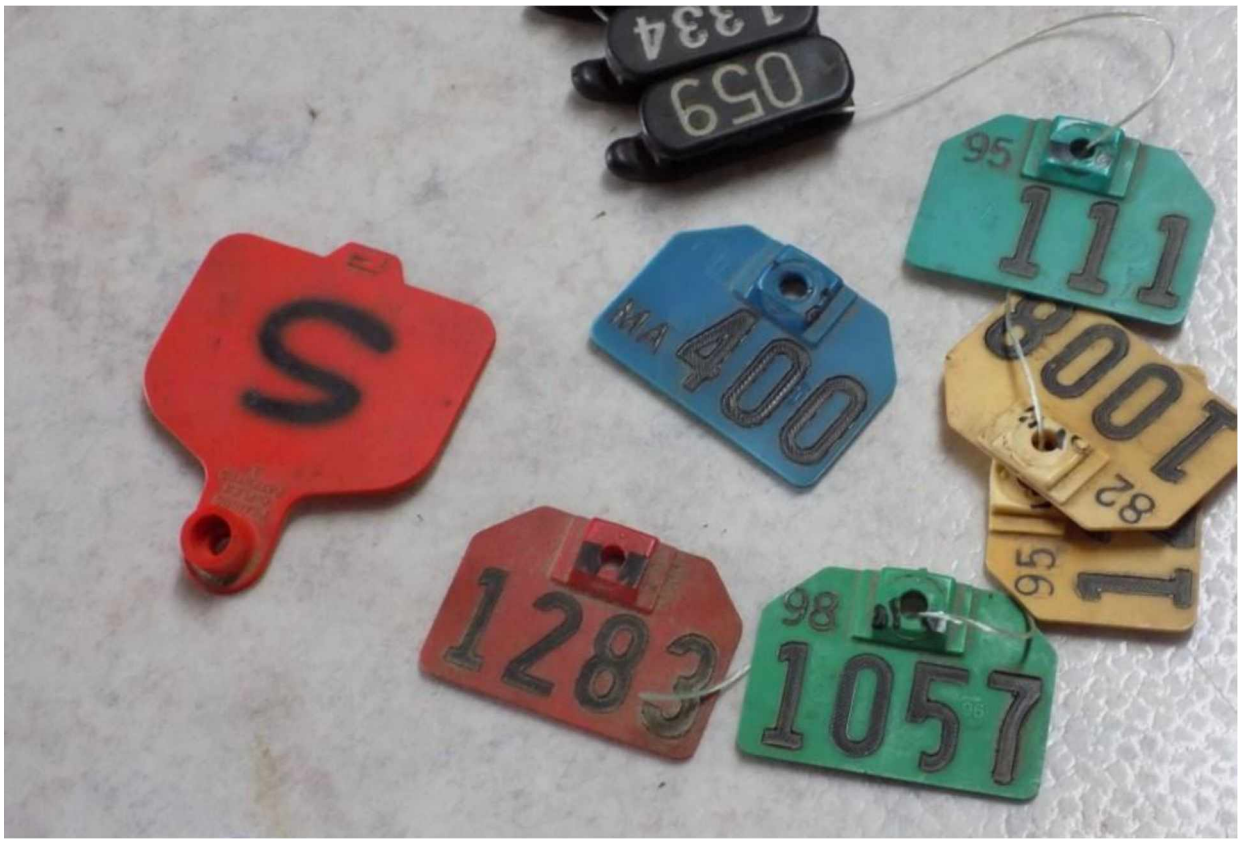

Figure 1.4: Reindeer eartags mark ownership and facilitate control over individual animals. The large red tag on the left is used to mark animals for slaughter. Photo by Odin Miller.

The commodity status of *Rangifer* meat and products is different from that of live *Rangifer*, although the animal's live status influences the commodity candidacy (Appadurai 1986, 14) of these products. For instance, while individual live caribou would not be considered commodities, caribou meat commonly becomes commodified. It has value, is circulated through generalized reciprocity, and is sometimes bartered. However, laws and customs largely confine its commodity candidacy to nonmonetary domains, with monetary exchange occurring only in local and regional networks. It seems unlikely that caribou meat would be sold at a village store

in Alaska, for instance (unless it could be passed off as reindeer meat), as the chances of legal repercussion would be too great.[4] Reindeer meat, on the other hand, can potentially be traded on global markets, but here too its status is ambiguous. Like caribou meat, reindeer has often been exchanged in traditional patterns of sharing and distribution (as I have encountered in my fieldwork for this project). It also has other customary uses as a commodity, frequently being used as compensation for help during herding activities in lieu of cash wages (Stern et al. 1980, 119-125). Despite the legality of selling reindeer meat, there are a number of regulatory hurdles that often prevent it from being sold on nonlocal markets, such as US Department of Agriculture inspection requirements (Alaska Department of Natural Resources 2014). Relatively local distribution of reindeer meat seems to have been its most common commodity candidacy throughout most of its history in Alaska; a condition not wholly different from that of caribou meat. Connecting reindeer with nonlocal markets requires concerted action to define it as "agricultural" in the eyes of state and federal regulators.

A final ambiguity involves the perception of *Rangifer* as food. Caribou are traditional food among Bering Straits Iñupiat, but were unavailable on many parts of the Seward Peninsula for more than 100 years (Burch 2012). Reindeer were available during much of this time and were part of Iñupiaq culinary tradition, playing a role very similar to caribou. My observations suggest that reindeer are generally considered "native food" or "traditional food" in Alaska's Bering Straits region. In rural Alaska, the term "native food" usually refers to wild foods harvested by hunting, fishing or gathering. Reedy (2016) points out that on the Alaska Peninsula, this includes local land mammals that are not native to the area.

[4] Admittedly, I am speculating here. On the other hand, the presence of officials who would inspect and enforce such regulations is limited in many rural Alaska villages. See 2.3.8 for a brief discussion of one Nome grocery store that sold Native foods during the 1970s and 1980s.

On the other hand, Yamin-Pasternak et al. (2014) point out that reindeer tends to be far more palatable than Indigenous foods such as marine-mammal meat to people from European backgrounds:

> Despite its slightly more "gamy" qualities, reindeer meat shares much more resemblance with beef or lamb than the meat of the marine mammals. More importantly, although reindeer meat is just as synonymous with food of tundra Chukchi as walrus meat is with food of the maritime Chukchi and Yupik, the first ranks far superior in being "good to think" (e.g., Levi-Strauss 1969) in the European schema of what type of flesh can become human food (Yamin-Pasternak et al. 2014, 624).

For this reason, reindeer has been far more tolerated than marine mammal meat among Russian-dominated institutions in Chukotka. In Alaska, reindeer products are often available at restaurants that cater to tourists—enabled, undoubtedly, by this palatability. My observation has been that it is often marketed as something a "taste" of Alaska. In 2016, a Fairbanks restaurant was fined for serving elk burgers that it advertised as reindeer burgers (Friedman 2016). Kotzebue's Nullaġvik Hotel, owned by NANA Regional Corporation, offers four "Iñupiaq tuttu dishes" on the dinner menu at its restaurant,[5] the word *tuttu* translating as either caribou or reindeer. The Nullaġvik orders its reindeer meat from Indian Valley Meats, a processing facility in Anchorage. When I called Indian Valley Meats to ask about their meat sourcing, the employee with whom I spoke said, "We get it from a distributor, so it comes from all over. We never know." The *tuttu* dishes at the Nullaġvik, then, purport to represent the traditional/local food of

[5] Nullaġvik Restaurant Dinner Menu, accessed 25 April 2018: http://www.nullagvikhotel.com/files/1915/1857/6550/NULL-001_Dinner_Menu_vwebFinal.pdf

Northwest Alaska, while the meat they contain is actually nonlocal; alienated from its source by its supply chain (*cf.* Tsing 2015).

As suggested above, these ambiguities reflect and parallel each other: just as human-reindeer relations are ambiguously wild and/or domestic, so reindeer meat is ambiguously wild and/or commercial. In other words, reindeer have the potential to become domestic, but this requires humans to continuously recognize, define and interact with them as such. Similarly, reindeer meat has the potential to become a marketed commodity, but this requires regulators such as the USDA to recognize it as "domestic" (i.e. processed according to their guidelines). The natural proclivity of reindeer to become "wild" makes them versatile and adaptable as a resource: they can survive without human intervention, their meat is often exchanged without money, and it is perfectly at home alongside other traditional ("wild") Iñupiaq foods. Yet as anthropologist Charles Stépanoff (2012, 290) points out, "[…] the paradox of reindeer herding is that, compared to other domesticated species, *humans can domesticate reindeer only if they keep them (in the) wild*" (emphasis in original). This creates vulnerabilities related to the fact that open-range reindeer have some degree of autonomy and cannot be completely controlled or predicted.

1.5 Methodology

My methodological approach has been "bottom-up," or inductive (Creswell 2014): while I began with a general topic and a tentative set of research questions, I adjusted these according to what I learned during the process. My overarching research question has remained similar throughout my research process, but most of the more specific questions I originally developed bore little resemblance to the final questions as reported at the beginning of this chapter.

I would describe my research philosophy as pragmatist, as per Creswell (2014). By this, I mean that I have not committed to a single, cohesive theory of knowledge production. Instead, I have attempted to integrate methods from a few different paradigms based on the contextual perspectives they contribute to my research questions. Most of my data has been qualitative, reflecting the interpretivist/constructivist paradigm that forms the backbone of most ethnographic work, with its concern for portraying and describing the complexity of research participants' views and understandings of human-*Rangifer* systems. However, I also found it worthwhile to incorporate some quantitative survey questions into this study. Because my research has been community-based, I felt that a survey would be useful toward understanding perceptions of reindeer among community members, and toward gaining a general sense of its magnitude as a community food source (see 1.5.1 Field methods section below). In this regard, I have taken cues from postpositivist environmental anthropology and some of its approaches toward nutrient/food resource production. I have sometimes heard ADF&G Subsistence employees describe their use of ethnographic interviews as a way of contextualizing their quantitative survey data. In contrast, I would see my own survey data as providing quantitative context to research whose focus is qualitative observation and ethnography.

While much of my research plainly emerges from the cultural constructivist tradition, I am skeptical of applying this paradigm in too literal of a way. Ingold (2000, chapter 1) argues that the framework is based on an assumed rigid dichotomy between nature and culture, in which culture is the exclusive domain of humans and exists on a separate plane than the nonhuman environment. He contrasts this with conceptions of nature/culture common among hunter-gatherer societies, who tend to regard nonhuman animals, plants and inanimate entities as persons with whom humans interact and form relationships. In my consideration of wildness,

domestication and related topics, I find it more useful to regard reindeer and caribou as contributing their own attributes to encounters with humans, rather than being mere passive objects of cultural construction. Multi-species ethnographies, which have become increasingly prominent in the recent anthropological literature seem to indicate growing acceptance of this viewpoint.

More generally, Indigenous scholar Shawn Wilson (2008) juxtaposes Indigenous knowledge/research paradigms against western ones such as constructivism and postpositivism. Referring, initially, to the western ones, he writes:

> [...] there is a common thread of thinking that runs through them. This commonality is that knowledge is seen as being *individual* in nature. This is vastly different from the Indigenous paradigm, where knowledge is seen as belonging to the cosmos of which we are a part and where researchers are only the interpreters of this knowledge (Wilson 2008, 38; emphasis in original).

In the Indigenous perspective Wilson describes, then, researchers do not *produce* knowledge so much as they access and convey knowledge that already exists at some level. In many ways this worldview seems quite sensible: even if the interpretive process (as per Wilson, above) is an act of creation, it is also a representation of something that already exists in the world. Why should only the human-created analog, and not the phenomenon it represents, be considered knowledge? Yet I also believe that my views about the origins of knowledge are not merely a matter of my own conscious choice or preference, as a researcher, but reflect my longer-term worldview, which has been shaped by my own cultural context. To be sure, I have attempted to understand and incorporate Indigenous epistemological perspectives during the course of this research—

including both those of formal academic presentations such as Wilson (2008) and those gleaned from the applied context of fieldwork. For me, cross-cultural learning and exchange has been one of the most appealing attributes of anthropological research. Yet to the extent that western research paradigms reflect western cultural assumptions, my research undeniably reflects these as well, as this is my native cultural context.

To the extent possible, I sought to cultivate healthy, reciprocal relationships with participants in my research. Wilson (2008, 77) has written that "respect, reciprocity and responsibility are the key features of any healthy relationship," and represent values of Indigenous research. I have not specifically employed an Indigenous methodology, but have sought to cultivate mindful awareness of these principles, particularly given that most of my research participants have been Alaska Native people. In this thesis, for example, I have attempted to quote and cite Indigenous knowledge-holders, alongside formal academics, as authoritative sources. Mindful awareness of these ethical principles is particularly important given Alaska's history of colonization, the associated subjugation of Alaska Native peoples and the role researchers have played in perpetuating these systems of oppression (Smith 2012).

1.5.1 Field methods

I conducted fieldwork for this project over roughly 4 ½ months between May, 2016 and November, 2018. Field sites included Nome, Teller, Brevig Mission, and Anchorage. The specific data collection and analysis procedures I employed for this research will be familiar to any student of cultural anthropology: participant observation, ethnographic interviews and a household survey.

- Participant observation entails observing or participating in relevant activities or in day-to-day life at field sites. At its most basic level, this can simply refer to researchers' ethnographic observations in the field. Participant observation is the single most important field method I used, as it allowed me to gain actual, first-hand familiarity with reindeer herding and its community context. During the course of my fieldwork, I participated in and/or observed a variety of activities, including different reindeer herding tasks, *Rangifer* hunting, food preparation, community social events and day-to-day life in the region. The volunteer internship that comprised much of my initial fieldwork was also an opportunity for ongoing participant observation. For the most part, I documented these experiences using field notes and still photographs; on a few occasions I also used video recordings.
- Ethnographic interviews, which can provide relatively detailed and specific information, are useful for documenting a range of topics including traditional knowledge and local history. Care must be taken to interpret interviews within their intended cultural contexts (Schneider 2011). During the course of my fieldwork I conducted a total of 21 ethnographic interviews, most of which I recorded with a digital audio recorder. In both communities, I interviewed reindeer herders, herding assistants, tribe and agency workers, caribou hunters and people with expertise on other relevant facets of local culture. Participants chose to either remain anonymous or to be recognized for their contributions of time and knowledge; I have listed the latter in Appendix 2. I offered each

participant a $50 honorarium as a thank-you for their contributions of time and knowledge, although several participants declined this honorarium.

- The survey entailed a fixed list of questions that I asked to members of households within each community. One advantage of survey research is that it employs a larger and more random sample of participants than standard ethnographic procedures do, thus soliciting a fuller cross-section of community viewpoints. This makes it a good complement for more in-depth ethnographic methods. The survey included a mixture of open-ended and closed-ended questions. Much of its focus was on qualitative, ethnographic data, but some questions were quantitative in orientation. For example, I sought to quantify community use of reindeer products. Survey respondents remained anonymous; I assigned each one with a random number. I offered most respondents a small gift as a thank-you token for their participation. See Appendix 3 for the survey protocol I used.

In addition to these methods I employed during fieldwork, I attended meetings of the Reindeer Herders' Association (RHA) and Alaska Reindeer Council (ARC), sometimes presenting updates on my research progress or findings. I sought consent from tribes representing research participants, and from the RHA, giving them an outline of my intended research and offering them the opportunity for feedback or further questions. The intent of this was to give them the opportunity for input into my research objectives, but without expecting a commitment of time or resources on their part. I held community presentations in both Nome and Teller at both the beginning and end of my data collection activities.

1.5.2 Initial fieldwork

My initial fieldwork was a 5 ½ week trip to Nome between May and July, 2016. I had just begun my studies and my research did not yet have a granular focus. This fieldwork gave me a chance to explore my initial ideas by seeing some of the on-the-ground realities of reindeer herding in the Nome area and discussing these with locals. The bulk of this fieldwork was a volunteer internship with Bruce and Ann Davis, and their daughter Bonnie Scheele, who own and operate the Midnite Sun Reindeer Ranch (MSRR) near Nome. It was supported by a mini-fellowship from EPSCoR and UAF's Resilience and Adaptation Program (RAP). My activities as an intern involved laboring and assisting with site preparation for the Global Reindeer Youth Summit (GRYS) the Davises were hosting in 2016. This included assorted tasks like helping to inventory supplies needed for the summit (e.g. camping equipment), painting the top of their horse-trailer, building a crib to store pieces of tin roofing, helping Bruce to haul debris to the dump, mowing grass around the property and helping to build picnic tables to be used at GRYS. This was important as it allowed me to develop reciprocal relationships with research participants (Stoecker 2013) and to learn about the day-to-day work involved in reindeer herders' lives.

On first glance, much of this work had little obvious, direct relationship to the task of herding and managing reindeer. Yet in this way of thinking, neither would the large amounts of paperwork that Ann completed each day, nor the maintenance required for the snowmachines and 4-wheelers the Davises use for herding. Human engagement with reindeer shaped all these activities. The debris Bruce and I hauled to the dump on Saturdays (when it was free) was the remains of the previous corral that they had dismantled several years earlier. When I mowed the

grass near the corral, I noticed pronounced contours in the ground underneath. The Davises explained to me that this had been the edge of the previous corral and that the contours were from the *aŋuq*, or reindeer droppings, that had built up over the years. GRYS itself represented a cultural investment into reindeer herding, both by MSRR and Nome Eskimo Community, who partnered with them to host the event.

GRYS gave me the opportunity to interact with a variety of people who are involved with reindeer herding in different ways. During the few weeks afterward, I accompanied Bonnie and members of her family on several trips into the tundra to try to locate their reindeer (we did not find them). Although most of this fieldwork was based at MSRR, I spent some time in the community, especially toward the end of this trip, and conducted some interviews with knowledgeable key respondents.

Figure 1.5: Midnite Sun Reindeer Ranch. Photo by Odin Miller.

1.5.3 Nome: Random-sample survey

I returned for a second visit to Nome in April and May, 2017, with the intention of conducting a random-sample household survey (Guest 2015) in the community. I had some basic

applied knowledge of survey methodology from previous employment at ADF&G Subsistence, which informed some elements of my survey's design, such as the procedures for estimating harvest amounts (see Analytic procedures below—section 1.5.5). However, for the most part the design and objectives of my effort were quite different than those of ADF&G's surveys (e.g. Braem et al. 2017; Mikow et al. 2018).[6] Many of my survey questions were open-ended, and many of the closed-ended ones were more concerned with documenting respondents' attitudes and perceptions than with quantifying their literal transactions with their environments. I believe this has left me more room to use them within an approach that is predominantly narrative and interpretivist (Creswell 2014).

I obtained a list of addresses from the City of Nome Real Property Search (https://www.nomealaska.org/department/division.php?structureid=39), and eliminated addresses that were obviously nonresidential. I attempted to verify that the remaining ones were individual residences using physical reconnaissance, but this proved to be impractical. The community of Nome includes many residents who live beyond its city limits, and I decided that I should include these as well. I printed aerial photos of outlying subdivisions from Google Earth, and spent considerable time verifying which houses were actually occupied, assigning these with tracking numbers on each map, which I then recorded in a Microsoft Excel spreadsheet. During

[6] While conducting surveys for ADF&G Subsistence, I sometimes received feedback from respondents that they felt some of the comprehensive survey questions to be quite invasive. Moreover, I feel that they are overly long, are predicated on respondents' being able to recall large amounts of quantitative details, and do not reflect local ways of thinking about and/or quantifying food. I have heard occasional reports of people fabricating responses out of boredom, frustration and/or lack of memory. In one resource-specific study for which I collected data, we were unable to survey the major harvester of that resource within a small study community, resulting in data that were obviously unreliable. Miscommunication about local resource categories has also caused unreliable data, as I discuss in the Western Arctic Caribou Herd section of chapter 3 (3.3.1). The division does not always do an adequate job of acknowledging these limitations in its reports. On the other hand, at least some of these mistakes seem easy to make in survey research: the survey protocol I designed for this project ended up being longer than necessary.

this time, I also corresponded with local tribes about my survey project, gave a community presentation about my plans, and engaged in some participant observation at MSRR. I tested the survey on several people in the community and made some minor revisions to it.

When I eventually began conducting the survey, progress was far slower than I had hoped, and I did not meet my original goal of surveying 75-100 households. In retrospect, planning such a survey in a large community like Nome was probably somewhat overambitious given the amount of time and resources I had.

I contacted selected households by knocking on their doors. I surveyed adult household members who had lived in Nome for at least the previous six months and were willing to participate. I made three attempts to contact each household before removing it from the sample. Few people responded on weekdays during the daytime, although response rates were better in evenings and on weekends. I did not have a vehicle, and so had to either walk or hitchhike to houses that were distant from the Nome townsite. By the end of my allotted time, I still had far too few surveys for a statistically meaningful sample of the community as a whole, a gap I was unable to close during a follow-up trip. Fortunately, these surveys produced quite a lot of qualitative data on community members' attitudes and perceptions, data that I have used extensively in this thesis. However, I am not sure whether the opportunity cost was worth it: I may ultimately have learned more through an approach that did not require the time investment of establishing and maintaining such formalized parameters.

The UAF Reindeer Research Program (RRP-UAF) and Dr. Greg Finstad made this fieldwork feasible by allowing me to stay at the RRP-UAF bunkhouse in Nome.

1.5.4 Teller fieldwork and attempted census survey

My advisory committee had encouraged me to expand the scope of my fieldwork to a second community. Teller was the most obvious choice because it is relatively close to Nome and still has an active reindeer herd. As a community, Nome is an outlier in the region, a large hub with community food systems that differ considerably from those of surrounding villages. Most importantly, comparative data from a second community has added explanatory power to this study by capturing a greater range of attitudes and approaches toward the topic of reindeer herding and food systems on the western Seward Peninsula. Nome and Teller currently have very different patterns of reindeer herd management, as well as of community access to and use of reindeer products.

My initial visit to Teller was a 2 ½ week trip in August, 2017, followed by a week in Nome. This fieldwork was made possible by a grant from the Center for Global Change and Robert Belous fellowship. Among other things, this funding allowed me to hire a research assistant, Pam Ablowaluk, a Teller local who was indispensable to the success of my survey project there. In order to facilitate comparison between the two communities, I used the same survey protocol in Teller that I had in Nome, with a few minor modifications.[7] I used a map from the City of Teller and a Microsoft Excel spreadsheet to track survey progress. Pam helped me in contacting respondents, often calling or texting them ahead of time, and helped me to keep track of which houses on the map were occupied. I ultimately achieved a 71% sample, enough for meaningful quantitative analysis. I also conducted interviews during this trip; this busy schedule

[7] In Teller, I modified survey questions C.1 and C.2—which prompted respondents to rank their use and preference for various local large land mammals—to include beef in addition to reindeer, caribou, moose, musk ox and brown bear. See chapter 4, Use and sourcing of reindeer products in Teller (section 4.3.2) for further details.

of formal research methods left me with limited time for participant observation or other activities.

In March, 2018, I returned to the region for 12 days, most of which I spent in Teller. By this point in my research, I had narrowed my topical interest and my primary concern was with filling in gaps in my knowledge. As a result, my approach this time was far more informal: I spent extensive time visiting and conversing with people I had met during my previous trip. I had the chance to observe some of the local culinary practice surrounding reindeer, and to accompany herder Jimmy Pushruk on an attempted reindeer hunt. I also spent time at grocery stores in Teller and Brevig Mission. Grace Ongtowasruk, a UAF student from Teller who was visiting home for spring break, helped with some of my research activities during this trip.

1.5.5 Analytic procedures

Qualitative data analysis was an ongoing process that I began after each field trip and revisited at various times while writing, as the refinement of my thesis structure brought specific questions and topics into focus. This is consistent with the "bottom-up" approach I mentioned in the Methodology section (1.5). I transcribed recorded interviews using Inquirium InqScribe transcription software (with a food-pedal), and entered survey data using Microsoft Excel. I used Provalis Research QDA Miner Lite for most of my qualitative coding. As part of the inductive process, I initially coded much of my qualitative data together in a single file, sorting them into broad categories and individual themes within each category. As I wrote my thesis, I coded more narrow selections of pertinent data as needed to address specific topics. This often took a more deductive form—for example, coding and tabulating responses to specific survey questions.

In Nome, I did not use survey data for quantitative analysis at all, as I did not achieve a large enough sample size. However, I have still presented some of these data—for instance, as tables showing the range of responses (mainly in chapter 4). Quantitative analysis was limited to Teller, however. I now recognize that my survey was longer than needed for this project, as I noted above. (I suspected this at the time I designed it, but had trouble deciding which questions to prioritize). To the extent that the survey questions stimulated conversation with respondents, they informed my knowledge and produced qualitative data. However, there are a number of quantitative questions that I did not use in my thesis. For example, the last section of the survey (Section D: Subsistence and local food) contained several ranked-order questions whose goal was to contextualize use of reindeer among other local foods. As my thesis came together, it became clear that the information that these questions had provided did not offer any truly unique insight or perspective that my qualitative data did not. Because this thesis is based mainly on qualitative data, it is presented in topical-narrative form, rather than following the step-by-step templates favored in the natural sciences (e.g. introduction, methods, results, discussion, conclusion). Chapters 2-4 of this thesis contain both results and discussion. I present quantitative data where they help to answer my research questions (see 1.1), but been selective with it in order to avoid inundating the broader narrative.

One goal of the survey was to estimate per capita harvest and use of reindeer in Teller. In question B.3.1 on the survey, I asked respondents to estimate the amount of reindeer members of their household had harvested during the previous year. Analytic methods for these specific questions were adapted from those that ADF&G Subsistence uses to estimate wildlife harvests (e.g. Braem et al. 2017; Mikow et al. 2018)—themselves standard statistical procedures gleaned

from Cochran (1977). I calculated the total community reindeer harvest using the following formula:

$$H_c = \mu_c * N$$

H_c is total harvest

μ_c is mean sample harvest

N is population (here, total number of households in the community)

I then used this to obtain per capita harvest, which I calculated as follows:

$$H_i = H_c / P * w$$

H_i is per capita harvest

H_c is total community harvest

P is the total population of individuals in the community

w is meat weight obtained from each reindeer.

I calculated P by extrapolating the household occupancy information I collected in question A.4 to the total number of households in Teller:

$$P = p * N / n$$

P and N are defined above.

p is the total number of people that all sampled survey respondents reported to be living in their households

n is the number of households surveyed

A city official told me that there were 68 occupied households in Teller at the time I conducted the survey, in 2017, yielding an estimated population of 221.[8] I have converted each reindeer to 136 lbs. of meat, the conversion value the Community Subsistence Information System website gives for "feral reindeer" in the Northwest Arctic region (ADF&G 2019).

Confidence intervals provide a way of estimating the magnitude of error expected for a given sample when expanded to the whole population. The values given for a 95% confidence interval indicate that (given good sampling procedures) a 95% chance that the population mean will fall in between the upper and lower values. I calculated a 95% confidence interval using the following formula:

$$\frac{CI = ts*\sigma/\sqrt{n}*(N-n)/(N-1)}{\mu c}$$

N and *n* are defined above

ts is t Student's statistic for a 95% alpha value. Because of the small sample size, the specific value was obtained from a table.

σ is the sample standard deviation, which I calculated using the built-in STDEV formula in Microsoft Excel.

[8] I regard the 68 occupied housing units as an authoritative figure, as it was given by a city official. However, this yields an estimated population that is somewhat lower than other contemporary population estimates. The city official who gave me the information explained that many people had moved away during the previous year. The US Census Bureau's Estimate for 2017 is 234—fairly close to my own. The Alaska Department of Commerce (2019) lists Teller's population as 251. Based on the complete census they achieved during their 2016 fieldwork, Mikow et al. (2018:3) indicate a population of 255 people and 77 occupied households. At any rate, my data indicate an average occupancy of 3.25 people per household, which is very close to other estimates such as Mikow's et al.

I also performed quantitative analysis on questions C.1 and C.2, in which I asked respondents to rank their comparative use and preference for various large land mammals, including reindeer. The purpose of these questions was to gain an understanding of how local availability of and taste for reindeer compared with that of other large land mammals such as moose and caribou. Because the values of these data are significant only as a comparison between categories, I could not use parametric procedures to analyze them. Because there were more than two groupings of data, I use the Friedman χ^2 test to determine whether there were statistically significant differences among the different groupings, and the Dunn-Bonferroni post-hoc to hone in on the pairs of groupings to which this applied. I performed these tests using IBM SPSS.

1.5.6 Limitations

Apart from chapter 2, much of this work is situated in the ethnographic present. I collected most of the data for this project between 2016 and 2018, and I wrote and revised this thesis during 2018 and 2019. Seward Peninsula reindeer herding is extremely dynamic at this time, particularly in Teller. Similarly, ADF&G biologists have indicated recent changes in Western Arctic Caribou Herd (WAH) migration patterns, with fewer caribou migrating as far south as the Seward Peninsula. As such, the circumstances of reindeer herding in the region—and of access to and use of *Rangifer* products—may be very different by 2025 than they are as of this writing. To some extent, they are also considerably different than they have been in the recent past. One example is that approaches to managing the Davis herd have changed in major ways during the past 15 years, as both its population size and the individuals managing it have changed during this time period. In this regard, chapters 3 and 4 should be read as a snapshot of a

particular time and place in the history of human-*Rangifer* relations in Alaska. However, I believe that the broader themes, such as reindeer-caribou ambiguity and the place of cultivated foods within rural Alaska communities, have recurred in various ways throughout the history of Alaska reindeer herding.

Along these lines, I should emphasize that both the Davis and Kakaruk herds are quite different from other Alaska reindeer herds, both past and present. It would be mistaken to presume that these herds are in any way "representative" of reindeer herds in the region, of which there are currently only six. In past decades, general patterns of Seward Peninsula reindeer herding (see chapter 2) have differed in a number of key respects from what we see presently in the Davis and Kakaruk herds. Most importantly, because ethnography is not reductive and focuses on contextual interpretation, its depictions should be regarded as localized and specific, rather than as "scalable" (Tsing 2015, 38-42) or as representing any kind of "average." Writing of case study research, Robert Yin (1994) argues that a case "does not represent a 'sample,' and the investigator's goal is to expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization)" (Yin 1994, 10). Rather, specific cases can be used to derive theoretical propositions by deconstructing phenomena and uncovering relational patterns that underlie them.

One limitation of the continuous, inductive process I used to develop this thesis' focus is that in some cases my research priorities have changed during the data collection process, superseding the topical foci of earlier data collection activities. In particular, this is reflected in some of the survey questions (Appendix C). With the exception of one question about reindeer-caribou differentiation (question C.5), my survey assumed a clear difference between reindeer and caribou rather than inquiring further into local perception of their similarity, difference and

ambiguity. Also, I did not ask about food processing or preparation, although during the course of the survey I had many informal conversations about this topic, which I made note of and used as data for Chapter 4. As I have noted throughout the thesis where appropriate, there are some limitations in the quantitative survey data I collected. These quantitative data are not intended to speak for themselves, but to furnish a rough metric by which to contextualize my ethnographic observations. Rather than being the main driver of this thesis' conclusions, the quantitative data are meant as one source of information that can be merged with the others to form synthetic conclusions.

1.6 Summary, propositions and thesis overview

Numerous writers, both academic and non-academic have considered Alaskan reindeer herding from a large variety of perspectives, as have Bering Straits Inupiat with traditional knowledge of the activity. Anthropologists are reasonably well represented among academic writers on the topic, although Alaska is not so well represented in the voluminous canon of Circumpolar literature on reindeer herding. In contemporary times, virtually all reindeer herders are connected with sedentary communities, yet few sources explore the role of reindeer products within these communities. In Alaska, there is a dearth of literature addressing the community-level impact of reindeer herding.

This is important in light of the food security concerns that are currently driving renewed interest in Alaskan reindeer herding. In fact, the topic of food within rural Alaska communities has been well documented in academic literature, anthropological and otherwise. Much of this has addressed wild food systems. Reindeer are rarely featured in discussions of wild food systems in Alaska—even in studies of communities with herds—because they are generally

viewed as domestic. In recent years there have been a number of studies on some of the food cultivation projects in which various rural Alaska communities are engaged, driven largely by concerns about the future of food. Reindeer herding can be seen as an example of this sort of food cultivation project. On the other hand, the overall role of reindeer as a food source has not been unambiguously separate from that of related wild foods, especially caribou. As such, exploring reindeer's role in community food systems represents a contribution not only to literature on emerging cultivated food systems in rural Alaska, but also to literature on wild food systems.

This ambiguity and versatility in the role of reindeer—both as a living animal and as a food source—is the central concern of this study. As a live animal, the process of domestication has shaped the characteristics of reindeer as a distinct, domestic variety of *Rangifer*. Yet this domestication is tentative, and must be continually reasserted by the herder, particularly when caribou are present. Here, Ingold's (2000) theoretical framework of hunting versus herding as relationships of trust versus domination is useful to this study, as are more grounded attempts to examine it, such as Donahoe (2012). Reindeer's behavioral/biological ambiguity, and the consequent need for herders to continually reassert domesticity over their animals, has cultural and legal parallels. In these domains, reindeer are disambiguated from caribou through achieving social recognition as domestic stock within human society. Yet the ambiguity does not stop with reindeer as live animals: their recognition as domestic/wild has implications for the degree to which the animals and their products can be commodified. This thesis draws on the theoretical frameworks of Appadurai (1986), Kopytoff (1986) and Wilkie (2005) in viewing commodification as a fluid process defined by the qualities of an item's exchangeability during a given phase of its life. As domestic animals, reindeer can be commodified in a more intensive

and monetary way than can caribou. Yet once again, this is dependent on a social-political recognition of domesticity: reindeer are generally considered "Native food" on the Seward Peninsula, just as Reedy (2016) has observed of the Alaska Peninsula.

Returning to the research questions I presented at the beginning of this chapter, I posit a corresponding proposition and set of sub-propositions, which I will defend in the following chapters:

• What is the role of reindeer within communities of the southwestern Seward Peninsula, particularly as a food source?	• Just as reindeer is versatile and ambiguous in its living relationship to humans (e.g. as a wild/domestic animal), it has a similarly versatile and ambiguous role as a wild/cultivated food source and potential item of exchange in Southwestern Seward Peninsula communities.
a. What are the general patterns of interaction between humans, reindeer and caribou, and how have these developed over time?	a. While herding has been a specialized human-animal relationship specifically between reindeer and relatively small numbers of humans, hunting is a generalized relationship that is enacted between a large variety of humans and animals.
b. How are reindeer socially constructed as a wild/domestic animal within local communities?	b. Human relations to reindeer as domestic animals depend not only on the extent to which the reindeer are managed or

	controlled by humans, but also on the extent to which they are defined and recognized as domestic (and as different from caribou) within local communities.
c. What are the general patterns of acquisition, exchange and use of reindeer products?	c. Reindeer can be commodified and monetarily exchanged to a much greater degree than caribou or other wild foods can, but for economic, institutional and cultural reasons, reindeer is prone to defaulting to modes of exchange that are nonmonetary or otherwise mirror subsistence patterns.
d. How does the social role of reindeer as a food source compare to that of caribou and other wild food sources?	d. While reindeer generally parallels caribou as a food source, its culinary attributes can potentially reflect both human control over the animals, as well as the interconnection of herding with globalized economies, institutions and modes of cultural expression.
e. How have changing relationships to food in rural Alaska influenced the way reindeer herding is conceptualized?	---

Note that none of these propositions respond directly to question e. (*How have changing relationships to food in rural Alaska influenced the way reindeer herding is conceptualized*?). This is because these relationships are very actively developing at this time, so conjectures about their eventual outcomes are necessarily speculative.

I address this set of questions, and their corresponding propositions, in the following chapters. Chapter 2 provides an overview of the history of human-*Rangifer* relations in the Nome-Teller area, with a more in-depth focus on the time period between the 1960s and the present. This chapter presents information that is relevant to each of these question-proposition pairs, but especially to a., c. and d. In Chapter 3, I address questions a., b., and c. In this chapter I focus on the contemporary status of human-reindeer-caribou relationships on the southwestern Seward Peninsula, and the human social systems that shape them. This chapter, as well as the following one, address questions related to the economic connections between reindeer herding operations and their surrounding communities. In Chapter 4, I look at the role of reindeer products, including their culinary use, commodification and exchange, addressing questions c., d., and e. This thesis concludes with Chapter 5, in which I offer a few perspectives on my overall findings, seeking to ground them in an exploration of the challenges that reindeer herders and other rural Alaskans are facing due to rapid change and uncertainty.

A challenge in writing about this topic lies in attempting to systematically depict a multidimensional web of social-ecological relationships within the constraints of a linear narrative. Any way of organizing such a narrative inevitably bisects some themes in order to allow others to maintain narrative cohesion. I selected the present arrangement carefully, with the goal of minimizing this sort of compartmentalization. This thesis could have been arranged in

multiple different ways, each of which might have emphasized different patterns and attributes within the data I have presented.

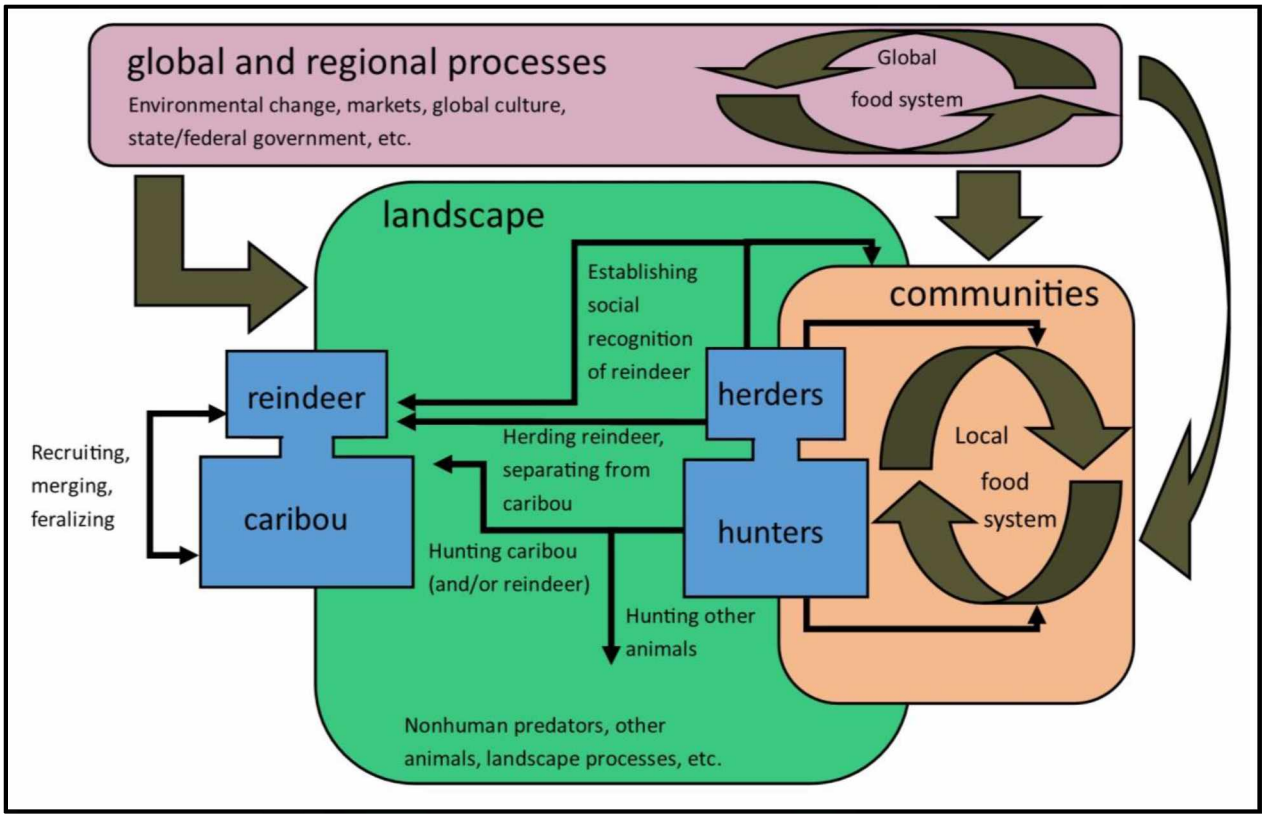

*Figure 1.6: A model of human-*Rangifer *systems as presented in this thesis.*

Figure 1.6, above, attempts to present a visual model of the attributes of human-*Rangifer* relationships I describe in this thesis. The Seward Peninsula landscape is the setting in which human-*Rangifer* interaction occurs, and on which the communities of Nome and Teller are located. Hunters and herders from these communities are fluid, overlapping categories of people defined by the kind of interactions they have with *Rangifer*. Similarly, reindeer and caribou populations are largely separate, but can easily intermix and will tend to merge together without human intervention. For this reason, herding reindeer partly involves keeping them separate from caribou. Unlike herding, hunting is an activity that can be directed toward either reindeer or

caribou (as well as toward other animals). For this reason, part of herding involves the herders' achieving social recognition of their herds as domestic within their home communities. Both herders and hunters input food into their communities' food systems. Finally, larger-scale global and regional processes exert powerful influence on all aspects of the Seward Peninsula's social-ecological systems (*see* Chapin et al. 2009), from climatic patterns to food systems.

Chapter 2: History

2.1 Introduction

This chapter presents an ethnohistorical overview of human-*Rangifer* systems on the Seward Peninsula, with emphasis on reindeer herding between the late 1960s and 2010s. This narrative focuses most heavily on how the lived experiences of herders, hunters and other community members have been intertwined with *Rangifer* (cf. Plattet and Lincoln 2014). I place less emphasis on the involvement of government or other outside agencies in reindeer herding or in caribou management: while this has played a critical ancillary role in shaping the ethnohistory, other writers have already covered this topic extensively (e.g. Lantis 1950; Stern et al. 1980; Postell 1990; Ellanna and Sherrod 2004).

In particular, this chapter addresses the following research questions:

a. What are the general patterns of interaction between humans, reindeer and caribou, and how have these developed over time?

c. What are the general patterns of acquisition, exchange and use of reindeer products?

e. How have changing relationships to food in rural Alaska influenced the way reindeer herding is conceptualized?

Reindeer herding is a relatively recent introduction to the Seward Peninsula, but human-*Rangifer* systems have a millennia-old history there. In pre-contact times, experience with *Rangifer* mostly involved wild caribou, but Bering Straits Iñupiat had some exposure to reindeer and their products through contact with neighboring Siberians (Simon 1998). While the

introduction of reindeer did not cause drastic cultural change within the local population (Simon 1998; Ellanna and Sherrod 2004), it did represent an entirely new epoch in the history of human-*Rangifer* systems in the region. Although the development of human-reindeer relations was heavily influenced by earlier histories with caribou, almost an entire century elapsed in which virtually all human contact with *Rangifer* in the region involved reindeer. Thus, Indigenous knowledge of caribou was preserved throughout the years of their absence from the peninsula, but actual interaction with caribou was very limited. On the other hand, the prevalence of very extensive reindeer management in some areas meant that some hunting for domestic/feral reindeer continued.

The history of 20th-century reindeer herding is sometimes divided into three historical periods based on its institutional structure: the early private period, the corporate collective period, and the reprivatized period (Lantis 1950; Stern et al. 1980; Simon 1998). The early private period spans the years between reindeer introduction (1891) and the 1910s or early 1920s, a period during which reindeer were privately, individually owned. The 1920s to the 1940s are described as the corporate collective period, during which reindeer ownership was organized into corporations in which individuals owned shares, the nonnative Lomen family invested heavily in the industry, and reindeer numbers boomed before an eventual crash. Finally, the reprivatized period begins after reindeer started to crash during the late 1930s, and after the 1937 passage of the Reindeer Act pushed reindeer herding back toward an individual, exclusively Alaska Native ownership model.

In comparison with its extensively documented early history, the past several decades of Alaskan reindeer herding history have received somewhat less attention. Several studies published between the 1960s and 1980s have documented it contemporaneously (e.g. Olson

1969; Stern et al. 1980; Stern 1980), while a series of more recent publications focusing on the caribou incursions of the 1990s and 2000s have described some of its history since then (e.g. Schneider et al. 2005; Finstad et al. 2006; Rattenbury et al. 2009; Carlson 2005). The UAF Project Jukebox Reindeer Herding compilation (discussed in chapter 1) is rich in ethnohistorical content, although this is presented conversationally (in pieces and parts) rather than systematically. Events of this period form much of the context in which present patterns of human-*Rangifer* relations, and their role in within Nome and Teller's food systems, have developed. Because of this, and the less-than-exhaustive state of historical literature on this period, it is worth examining in more detail.

This more recent history can be roughly divided into two parts. I do not attempt to assign exact dates to these historical periods, as they should properly be regarded as uneven, overlapping and somewhat arbitrary. From the 1960s to the 1990s, the reindeer industry underwent a period of moderate, sustained growth. Commercialization gradually intensified as cash economies played an ever more important role in rural Alaska, and herders gained access to a global market through velvet antler sales (Stern et al. 1980; Koskey 2003). The second historical phase is marked by the reappearance of caribou on the Seward Peninsula, beginning during the 1980s and 1990s and continuing to the present. During this period, human-*Rangifer* systems changed dramatically as caribou reappeared in the area and subsumed most of the peninsula's 15 reindeer herds, eclipsing reindeer in importance as a food source in many communities.

2.2 Human-*Rangifer* systems through the mid-20th century

2.2.1 Caribou hunting systems of the 19th century and earlier

Prior to the large-scale social changes of the late 19th century, the Iñupiat of Northwest Alaska were divided into about 20 different "societies" (Burch 1975), "tribes" (Ray 1975) or local groups, each of which was associated with mutually exclusive territories. As Ray (1975, 108) put it: "As between sovereign nations today, permission was needed to travel between tribes, and names were the important passports that proved relationships and served as entry to another territory." The study area for this project is on lands traditionally belonging to three such local groups. The Nome group extended from the mouth of the Fish River in the east to Cape Wooley in the northwest, including the villages such as Sitnasuak and Ayasayuk—and later the site of present-day Nome. Like virtually all of Northwest Alaska, it included numerous seasonal camps in addition to the above-named larger villages. The modern communities of Teller and Brevig Mission are located on the lands of the Sinġaamiut group, which encompassed the territory from Cape Woolley in the South to the York Mountains in the North, and inland to the upper end of Tuksuk Channel. Major traditional villages in these territories included Sinġaq (for which the society was named), Qiŋaugaq, and Cape Douglas (Koutsky 1981, 11). Finally, the Qawiaraġmiut lived directly east of the Sinġaamiut, on lands that correspond roughly with the watershed of the Kuzitrin River. Qawiaraq, the main village of this local group, was one of the largest in the region during the 19th century (Koutsky 1981). This was later supplanted by the communities of Igloo and New Igloo, both of which were abandoned as permanent settlements by the early 1950s (Rennick 1987). Today, Teller's population includes descendants of both the Qawiaraġmiut and Sinġaamiut, and many of its residents still make extensive use of Qawiaraġmiut territory on a seasonal basis.

Based on a study of oral/archival histories from Northwest Alaska, Burch (2012) has concluded that if a caribou "herd" is defined by cow fidelity to a particular calving ground from year to year, most of the caribou herds in the region today cannot meaningfully be considered as the same herds that were present during the mid-19th century. The only caribou herd present in contemporary Northwest Alaska is the WAH.[9] Burch postulated that three additional herds were present in the region in the mid-19th century: Nulato Hills Herd, Andreafsky River Herd and Seward Peninsula Herd (SPH). At the time, the southern extent of WAH was on the northern shores of Kotzebue Sound (Burch 2012, 82). As its name suggests, the SPH's entire migration route was contained within the Seward Peninsula, with summer calving grounds on the northern coastal plain and winter range in the inland, mountainous areas. Caribou herd size correlates strongly with length of migration route; the SPH clearly had a short migration route and is believed to have been a relatively small herd.

Although most Bering Straits Iñupiaq communities relied on marine mammals and fish as primary food sources, caribou were also extremely important. Not only were they a major food source, but they were indispensable in providing clothing materials. Unlike other land mammals such as musk ox or moose (which did not arrive in the area till the 20th century), caribou are migratory and travel in much larger herds, meaning they can be intercepted and taken in large numbers at once. On the other hand, caribou migration routes are variable over a timescale of decades, and the consequences of missing such a large harvest opportunity could be disastrous for groups that depended heavily on them. Burch (1972) suggests that such groups were prone to famine every two to three generations due to fluctuations in herd size and migration routes.

[9] The Western Arctic Caribou Herd (WAH) currently migrates between a winter range on the Seward Peninsula and Norton Sound in the South, to a summer range on the western part of the North Slope. See chapter 3 for a more detailed overview of the present-day status of WAH in the Seward Peninsula region.

Of the five-six traditional Iñupiaq societies that inhabited the Seward Peninsula mainland at the end of the 19th century,[10] the Qawiaraġmiut were among the most heavily dependent on caribou (Burch 2012, 73). Their inland location was both directly in the path of caribou migration routes, and distant from the marine resources on which other societies relied. Caribou harvests among the Qawiaraġmiut and others in the region[11] tended to be large-scale, cooperative events in which hundreds of animals could be harvested. William Oquilluk (1981), whose oral history of the Qawiaraġmiut includes extensive descriptions of traditional relations to caribou, describes practices associated with corralling and harvesting them:

> The menfolk went out to hunt caribou. If they saw a herd, they would not go near them. They would build a corral. The corral was made out of willows and bound together with rawhide ropes. The people of Kauwerak had a special ceremony for this time. They had an ugly mask carved of wood. An *aungutgouk* [shaman] would carry the mask to the corral to a pile of stones that looked something like a man. He would stick the mask in the stones. The people could see if the mouth shed lots of blood, that meant they would get lots of caribou. If it did not shed much blood, they would not get many animals.
>
> The men would chase the caribou to the corral. They usually chose two men to guide the herd from each side so they would go into the opening of the corral. The ones that went inside they would kill with spears and knives. Every hunter got the same amount as any other man. They skinned them all until all the animals were skinned out. (Oquilluk1981, 97-98).

[10] This does not include the southeastern portion of the Seward Peninsula, most of which was Ungalik (Norton Sound Yup'ik) territory till the late 19th century (Ray 1975).

[11] Qawiaraġmiut were allied with the King Islanders and permitted the latter to hunt caribou on their lands. Sometimes people from the Kiŋikmiut (Wales area) and Diomede Island were also permitted to hunt caribou on the Kuzitrin River (Ray 1983:161-162).

During the summer months, a common caribou harvest method involved chasing aggregations of caribou through drivelines made of rock cairns that funneled them into lakes, where men in kayaks then speared them (Ray 1975, 117-118). In the Imuruk Lake area of the north-central Seward Peninsula, hunters used the lava beds in the area to harvest caribou, driving them across the porous lava rock where they would break their legs and become stuck (Karmun 2002).

Bering Straits Iñupiat commonly preserved caribou meat by drying it in thin strips, which they could then eat with seal oil while traveling or hunting. They boiled caribou meat, bones, viscera, heads and hooves, and made a sweet dish called *agutuk* from caribou fat mixed with berries (Oquilluk 1981; Ray 1975). Caribou were also critically important for non-food uses: 19th-century Iñupiat relied on caribou hides as one of their main clothing materials, used their sinew for twine and burned their fat in traditional oil lamps.

The SPH began to decline in the mid-19th century, and became extinct well before the end of the 19th century (Burch 2012, 72-73). Given their dependence on caribou, Qawiaraġmiut suffered immediate impacts and began emigrating from their homeland. As caribou became increasingly scarce, the Seward Peninsula's inhabitants were forced to look to alternate food sources such as fish and marine mammals. However, some marine mammal populations had become depleted as a result of American whaling in the arctic. Moreover, caribou had been the most important clothing material throughout the region, and could not easily be replaced. Burch asserts that the decline of the SPH drove a mass exodus of people from the Seward Peninsula, and that declines of caribou herds elsewhere ultimately caused large-scale patterns of northward migration during the late 19th century. Scholars such as Olson (1969), Ray (1975) and Ellanna and Sherrod (2004, 75-6) have expressed skepticism toward the notion that there were massive

food shortages and outmigration during this time period, but Burch (2012, 74) has convincingly pointed to methodological flaws underlying these critiques.

2.2.2 Reindeer introduction and the early private period

The extent to which reindeer introduction to Northwest Alaska was motivated by food security concerns is still debatable, and perhaps ultimately a matter of speculation. The regional food shortages of the late 19th century were the clearly stated rationale for introducing domestic reindeer to Alaska between 1891 and 1901. Alaska's territorial Commissioner of Education, Rev. Sheldon Jackson, lobbied US Congress for the introduction of reindeer as an alternative food source. Jackson, who was also a Presbyterian minister, set up a reindeer apprenticeship program based at missionary/industrial schools. He contracted Sámi herders from Norway to train local Iñupiat as herders.

Unfortunately, Jackson's administrative decisions often appeared to show more concern for nonnative settlers' food security than for that of Iñupiaq communities, toward which his agenda focused heavily on their conversion to Christianity and assimilation into Euro-American culture. Iñupiaq apprentices were given very small numbers of deer—if any at all—during the course of their multi-year apprenticeships. Unlike Sámi instructors and mission schools, Iñupiaq apprentices were forbidden to slaughter their reindeer, even under starvation conditions (see Ellanna and Sherrod 2004, 67-115 for a detailed consideration). In response to ongoing frustration about this situation, a few Iñupiat were eventually allowed to start reindeer herds during this time period, beginning with Charlie Antisarlook from the Cape Nome area.

The influx of miners at around the turn of the century brought many outsiders to new settlements such as Nome, Teller and Deering, creating nonnative demand for reindeer products

(as well as frequent reports of poaching by hungry prospectors). This demand helped Jackson in his efforts to lobby for funds to the support the project (Olson 1969, 27-28). In addition to being sources of food and clothing, reindeer were sometimes used for sleds and packing supplies, although the extent of this has been debated (Ellanna and Sherrod 2004).

Jackson's alleged use of government resources for missionary activities did not go permanently unnoticed, nor did his failure to enable access to reindeer by Alaska Native people. In 1906, following a congressional investigation, Jackson was removed from his post as Commissioner of Education, and policies shifted in favor of Native reindeer ownership.

During the 10-15 years that followed, Bering Strait Iñupiat generally had greater control over reindeer, often integrating it with other cultural activities (Simon 1998). One role of early reindeer herds was as a backup food source for times of scarcity; herding activities were often conducted concurrently or synergistically with hunting, fishing, trapping and/or gathering. According to Simon:

> In general, Iñupiaq reindeer herders continued to utilize traditional subsistence resources along with their reindeer products after reindeer introduction. Native elders recollect that reindeer meat added variety to their diet, and that whenever the family started to get bored with their sea mammal or fish diet, they could always eat reindeer meat. More importantly, however, elders remember that reindeer provided food in times of scarcity. After acquiring reindeer, shortfalls in subsistence resources did not have the same damaging effects, as one could always go to the herd and butcher an animal to feed the family. [...] Food storage in living animals was the basis of reindeer herding wealth. (Simon 1998, 168)

Cash did not yet play a large role in Bering Straits Iñupiaq culture (Burch 1975; van Stone 1984), but reindeer products were valuable as exchange items, and their distribution allowed herders to attain prestige. Compared with today, settlements were more widely dispersed throughout the landscape, as were herds. By the 1910s, the number of herds had grown to the point that it was difficult to find land to start new ones (Karmun 2001). In some cases, opportunities afforded by reindeer herding drove decisions to migrate or resettle. John Kakaruk, Sr., the first in a family line of Teller-based herders, acquired his first reindeer in 1916 in the Igloo area, as per a bill of sale that one of his relatives still possesses. Reindeer were used extensively in Iñupiaq culinary traditions, and also in those of European/American settlers that had moved into the area.

Sources on this period suggest a more unambiguous reindeer-caribou divide than currently exists. There would have been little question at the time of any animals on the peninsula being caribou, which had been absent for several decades. More importantly, reindeer herding during this period took the most intensive form it has seen to date, with herders generally living with their herds on a nearly year-round basis (Ellanna and Sherrod 2004). Iñupiat had long been aware of reindeer through contact with the Chukchi (Simon 1998); Iñupiaq worldviews recognized them as clearly different from caribou. As wild animals, caribou were imbued with autonomy and deserving of respect in Iñupiaq cosmology. Reindeer, on the other hand, were seen as subservient to humans, much like domestic dogs (Simon 1998, 182). Origin stories alternatively told of reindeer as having an entirely different genesis from caribou, or as having changed in response to prolonged contact with humans (Ellanna and Sherrod 2004, 47-48, 180).

Notwithstanding this new human-animal relationship and its associated worldview, the introduction of reindeer herding did not bring about large-scale changes to Iñupiaq culture as a

whole. Herding was practiced only by a segment of the population, and never became a central piece of Iñupiaq economy or identity (Simon 1998; Ellanna and Sherrod 2004).

Reindeer drives during much of the early private period established a far-flung network of herds throughout western Alaska, from the Colville River delta in the northeast to the Alaska Peninsula in the southwest (Stern 1980, 88-95). The growth of Alaska's reindeer herds continued through the 1920s and had broad implications for human-*Rangifer* systems throughout Alaska. Most significantly, Burch (2012, 17) has shown that it played a critical role in shaping the 20th-century development of caribou herds in the region: "[…] the affairs of the two subspecies [of *R. tarandus*] in Northwest Alaska were inextricably linked; the history of one cannot be understood without knowledge of the other." While Burch's primary focus here is in the natural history of caribou, the same statement would arguably apply to the ethnographic significance of reindeer and caribou on the Seward Peninsula. Much of northwest Alaska has had experience with both varieties of *Rangifer* at some point during the past 125 years. However, it has been much rarer for communities to have had sustained access to both reindeer and caribou—or to have sustained the practices of both reindeer herding and large-scale *Rangifer* hunting—at one time.

2.2.3 Corporate/collective period

By the mid-1910s, Bureau of Education administrators began advancing policies of "open herding," in which the reindeer herds were left unattended for part of the year. These officials pressured reindeer owners to merge their private herds and form corporate associations, in which individuals owned stock shares rather than owning the animals directly (Ellanna and Sherrod 2004; Olson 1969; Simon 1998). The agency held annual reindeer fairs to promote exchanges of

skills and knowledge, but also as a way of encouraging the herders that attended to form associations (Lantis 1950).

The Spanish flu epidemic of 1918 had a devastating effect on communities in the Nome area, dramatically reducing capacity for reindeer herding in the area. Mary's Igloo alone lost two-thirds to three quarters of its inhabitants (Stern et al. 1980, 44-45). This shortage of human capacity hastened the collectivization of reindeer herds into associations. Most of these were eventually incorporated into joint stock companies during the course of the 1920s, and many gradually became dysfunctional, plagued with administrative issues and management disagreements (Stern et al. 1980).

To some extent, this collectivization push reflected the influence of the Lomen family, a wealthy nonnative family with immense political power in the Nome area. In 1913, the Lomens purchased a herd from an Iñupiaq herder named Alfred Nilima, beginning their large-scale acquisitions of reindeer and infrastructure toward the goal of creating an export market in the lower 48 (Stern et al. 1980, 40), the first appearance of commercially-oriented herding on any significant scale. They invested heavily in infrastructure, building abattoirs, cold storage facilities, ships, and port facilities. They introduced cattle ranching-style corrals that could be used to process large numbers of reindeer at once. The basic design of these corrals is still used in the area today. As the Lomens became more deeply invested in building and controlling the reindeer industry, they allegedly became increasingly ruthless in their efforts to ensure favorable government policies (Mozee 1933; Ellanna and Sherrod 2004). Government promotion of open herding policies was partly a result of the Lomens' influence. Rather than staying on assigned ranges, reindeer mingled freely throughout the peninsula during much of the annual cycle, a

situation that the Lomens used to their advantage in competing against Alaska Native herding associations (Ellanna and Sherrod 2004).

The Lomens' business endeavors never became profitable. They had overcapitalized, had had difficulty attracting investors, and were unable to overcome the high costs of long-distance shipping. They had also engendered significant political opposition, both from supporters of Alaska Native herding interests, and from the cattle industry in the lower 48, which was wary of the potential competition (Beach 1985, 14). These pressures culminated in the passage of the US Reindeer Act in 1937, which stipulated that only Alaska Native people could own reindeer (Ellanna and Sherrod 2004, 108-111), while excluding reindeer from the agricultural subsidies that cattle producers receive.

The Lomens' effort to make reindeer into an export commodity contributed to the unsustainable expansion of reindeer herds through the 1920s. Statewide reindeer population peaked at more than 600,000 in 1933. A few years later it began a deep decline that lasted for nearly two decades (Olson 1969; Stern et al. 1980). Overgrazing, predation by wolves and loss of herding capacity to World War II also played significant roles (Stern et al. 1980), as did caribou migration on the eastern edge of the Seward Peninsula and in other parts of Alaska.

In some ways, the collective period presaged trends of reindeer commercialization during the later 20th century. The Lomens' activities, in particular, brought about a highly uneven increase in the intensity of reindeer commodification. The prevalence of associations that owned large, loosely-managed herds created a degree of alienation between herders and their reindeer. Among collectivized herds, corporations owned the reindeer; individual Iñupiat merely owned stock shares corresponding with certain numbers of animals. Large-scale nonindigenous ownership of reindeer introduced a set of relationships to it that were more directly shaped by

colonizing cultures and economic systems. In the Lomens' vision of reindeer as an export commodity, the demands of the globalized, monetary economy necessarily drove herding decisions as much as local social-ecological relationships did.

For many Inupiat at the time, the practical reality of this period would have been alienated ownership of reindeer without much commercial benefit. As Olson has remarked, writing a few decades after the end of this period:

> Although it is virtually impossible today to find a middle-aged Bering Strait Eskimo male who did not at some time in his youth own "many" reindeer, it should come as no surprise to find that it is difficult to get a definite idea of the exact number owned or what eventually happened to them. The period of the early 1930's was a time of great reindeer plentitude, and also a time when reindeer ownership produced a minimum of emotional and material reward (Olson 1969, 51).

On the other hand, some herders have suggested that the large numbers of reindeer during this period produced an abundance of meat and other reindeer products that were distributed widely during handlings (e.g. Davis 2001; Karmun 2001).

2.2.4 Post-reprivatization, 1940s-1960s

As domestic reindeer populations continued to decline during the early 1940s, the BIA worked to reprivatize herds that remained. Herd populations and ownership eventually stabilized, at least on the Seward Peninsula. Here, reindeer herding steadily grew from a low during the 1940s, but elsewhere in mainland Alaska it continued to decline, all but disappearing by 1960 (Stern et al. 1980; Olson 1969). In some ways, herding during this period initially resembled the

situation prior to the collectivization of the 1910s-1940s (Simon 1998). According to Finstad et al. (2006, 37), "The period of re-privatization and establishment of new herds resulted in a relatively stable industry where herd populations and product output remained constant."

When the government reprivatized the herds beginning in the early 1940s, it placed the animals in trust under the direction of the Bureau of Indian Affairs (BIA; Stern et al. 1980, 79-82). The BIA facilitated the repopulation of rangelands on the peninsula by establishing a reindeer loan program that allowed prospective herders to obtain loans of reindeer from other herders (Stern et al. 1980, 82). It also began requiring grazing permits for rangelands and imposed stocking restrictions on each range. As a result, access to lands for herding became far more limited than it had been during the early private period (Simon 1998).

By the end of the 1940s, only three officially recognized herds remained on the entire Seward Peninsula: the Aukongak herd at Golovin, the Thomas herd at Candle, and the short-lived Topkok herd to the north of Teller (Stern et al. 1980, 84-85). However, a number of new herds were established on the peninsula during the following decade (Stern et al. 1980, 96), including Teller's Kakaruk herd, which Johnny Kakaruk, Jr. began in 1950 (Stern et al. 1980, 82). The Kakaruk family, originally from the Igloo area, also had a long history in reindeer herding: Johnny Kakaruk, Sr. had herded reindeer from 1916 until the 1930s, but this herd was lost during the crash. According to one relative with whom I spoke, Johnny Jr. had initially tried to start a herd on the Kuzitrin with a loan of several hundred deer, but lost this herd and received another loan shortly thereafter (Anon. 2018). This time he grazed the herd mostly on the coastal forelands to the west of the Kigluaik Mountains, closer to Teller. In 1955, Kakaruk built a corral along the estuarial Tuksuk Channel using materials from Plant, an abandoned processing facility that the Lomens had built during the 1920s (Conger 2015).

During the reprivatization efforts of the 1940s, the BIA began encouraging herders to return to close herding, or living continuously on the tundra with the reindeer (Finstad et al. 2006, 36-7). In fact, some herders of this time engaged in the activity rather intensively. Like many who grew up herding during this time period, Johnson Stalker was unable to complete school due to the demands of reindeer herding, as he explains:

> When I was kind of young and I tried school, and I'll be out of school for winter and go back to school and I can't go further because I'm not schooling all the way through. And then [...] I've been in second grade for how many years and then, so, become a regular reindeer herder, like, you know. I think that's my goal. That's my—my mind is that way. That I could read animals, not the paper like this. (Stalker 2001)

Yet even as the BIA encouraged close herding, social and institutional forces were pulling in the opposite direction. Although Stalker's childhood experiences were not uncommon for the 1940s, long-term life on the tundra gradually became more impractical for herding families as children were increasingly expected to attend school. Education became compulsory for all Alaska residents following statehood in 1959.

In addition to formalized education, many other factors contributed toward the sedentarization of Bering Straits Iñupiat into permanent villages—one of the dominant cultural processes of the 20th century in rural Alaska and throughout the arctic. Sedentarization had already begun by the time reindeer were introduced to Alaska at the end of the 1800s (van Stone 1984). It accelerated during the Great Depression, when slumping fur prices caused white traders to leave the region. Iñupiat who had depended on trade-goods began migrating to settlements with public facilities. By 1970, all residents of Northwest Alaska were settled in either villages

or towns, rather than the isolated extended-family outposts that had characterized the region during its previous history (Burch 1975, 277). As late as the 1950s and 1960s, some reindeer herders and others in the region were willing and able to live for much of the year on the tundra with their animals. But during the course of the latter 20th century, it became increasingly rare for herders to travel and camp with their herds for extended periods.[12] On the other hand, sedentarization was not the only cultural factor that favored more open herding practices. Olson (1969) suggests that Iñupiaq cultural patterns have often tended to favor economic diversification ("generalization")—harvesting different wild foods at different times of the year—as opposed to the specialization of year-round reindeer herding.

Closely associated with sedentarization is the development of cash economies in rural Alaska, a primary driver of the development path reindeer herding took during the second half of the 20th century. Village life afforded much greater access to the goods and services of a monetary economy than was available through occasional transactions with traders and merchants. In turn, this dependence reinforced the trend toward sedentarization, as employment opportunities have often been located in or near villages (Stern et al. 1980). While settlement locations in traditional times were largely based on access to local foods (Ray and Pierce 1983, 173-226), access to cash income and other services was becoming an increasingly important factor. The Qawiaraġmiut remaining in Igloo and New Igloo had migrated to Teller during the 1940s and early 1950s, after the school and grocery store there closed (Rennick 1987, 31).

The steadily increasing role of cash economies in rural Alaska was having influence on both the practice of reindeer herding and its role in community life. Yet monetization of the activity only extended so far during this period. Commercial sales of reindeer meat mostly

[12] An exception to this is that during fawning season, some herders continued staying in cabins near their reindeer herds into the 1990s.

occurred at local stores, which typically purchased meat from the herd owners in exchange for store credit. Olson (1969, 102, 118) points out one economic result of this: herders' markets depended directly on their own consumption needs. Because they could not spend store credit earned from meat sales outside the village, there was little reason to sell meat to the store in greater amounts than the value of their consumption needs in a given year. This resulted in high variability in the availability of meat available at village stores from year to year.

Otherwise, the distribution of reindeer meat still occurred largely on a nonmonetary basis, and herders were expected to meet Iñupiaq social obligations by sharing meat and other reindeer products with their extended families. Winter roundups and slaughterings were typically community-wide events at which there were opportunities to work in exchange for reindeer meat, and all who attended were fed. Workers were sometimes paid in cash, or more typically in groceries or other products, especially if they already had enough reindeer meat. In this way, herders' distribution of goods in exchange for labor increased their need for local store products, incentivizing them to sell more meat to the store. Larry Davis recalls roundups at Deering during his childhood and youth:

> Yeah there was cash paid for it, but there was not much need for cash them days, 'cause they mostly wanted to take the trades: like flour, sugar, milk and coffee. And then gloves. You know, you always had to have gloves. And then of course tobacco—tobacco was big then. (Davis 2001)

Although Davis' description here refers to the situation during his childhood years during the 1930s and 1940s, Olson's (1969) overview of reindeer herding economics in the 1960s indicates a similar pattern. To a certain extent this pattern continues even today in communities that still

have reindeer herds connected with them. Generosity in sharing food is still an important part of Iñupiaq culture.

2.3 Development toward commercialization, late 1960s-1980s

2.3.1 Late 1960s: Rural Alaska economies and reindeer herding

By the end of the 1960s, a clear majority of herding operations on the Seward Peninsula belonged to the immediate families that still (as of 2019) hold grazing permits for these same rangelands. The Kakaruk family had already owned its Teller-based operation for nearly two decades, while Larry Davis had begun his herd a few years earlier (Stern et al. 1980, 88-89). Ralph Kugzruk of Teller had a herd across Port Clarence to the North during this time period, but this shortly became defunct, and in 1970 the Olanna family of Brevig Mission began grazing reindeer in the area (Olanna 2003). These families, and most others on the peninsula at the time, had histories of herding during the early 20th-century, but many had become inactive after the crash of the 1930s and 1940s. As socio-economic conditions became more favorable to herding during the course of the 1950s and 1960s, their younger kinsmen took up the activity again (Schneider et al. 2005, 41). At this time, there were eleven reindeer herds on the Seward Peninsula, containing a total of approximately 16,000 animals (Stern et al. 1980).

By many accounts, economic opportunity motivated growing interest in reindeer herding during this time period. As mentioned in the previous section, cash economies played increasingly important roles in Northwest Alaska during the mid-20th century with dependence on wage employment growing rapidly during the 1960s and 1970s (van Stone 1984, 159). As money became ever more important as a factor in village life, greater opportunities gradually emerged to market reindeer products for local sale (Stern et al. 1980; Simon 1998). Similarly, as

expenses associated with herding grew, herders themselves became increasingly dependent on the monetary economy. Job opportunities in villages were still largely limited to temporary, seasonal gigs such as construction and snowplowing, but Nome had long had a far greater variety of paid employment as well as opportunities for monetary consumption.

2.3.2 Late 1960s: Introduction and adoption of snowmachines[13]

Alongside this increased dependence on money, the use of snowmachines marked a significant innovation in how reindeer were herded in this period. In prior decades, wintertime herding was done by dogteam, on foot, or occasionally by reindeer-sled (e.g. Hadley 2001; Stalker 2001). By the end of the 1960s, less than five years after their debut, all reindeer owners on the Seward Peninsula had acquired snowmachines (Stern et al. 1980, 97).

The transition to snowmachine represented a further shift away from an economy based predominantly on local resource use toward one that required continuous cash expenditures on goods of nonlocal origin (Schneider et al. 2005). As Shishmaref herder Clifford Weyiouanna (2002) remarks: "snowmachines you don't have to feed every day—you have to buy gas." Unlike dogteams, which cost little money at the time but required large fish/meat harvests to feed, use of snowmachines represented an intensive, ongoing monetary commitment with no direct requirement for land-based activity (e.g. hunting, fishing) to sustain them. A general consequence was that larger minimum herd sizes were needed to generate sufficient revenues for parts, gas and new snowmachines (which herders often need on a yearly basis). Pelto (1973) documents related trends among the Skolt Lapps (Sámi) of Finland during the early years after

[13] Most anthropological literature uses the more universal term *snowmobile*. However, I have used *snowmachine* throughout this thesis as it is the local term and ubiquitous throughout Alaska.

snowmobiles were introduced: many families were forced to discontinue herding because their herds were too small to sustain the technological expense.

In other ways, snowmachines counterbalanced some of the impacts of sedentarization: their speed allowed herders to make daily visits to their herds without requiring extensive time away from village and family life. Dedicated herders have described being able to practice a new, village-based form of close herding during the winter months (e.g. Henry 2002; Sagoonick 2003). Snowmachines were also sometimes used for herding during the summer months, although summertime herding was most commonly still done on foot into the 1980s and 1990s. During the spring breakup and fawning season, some herders still stayed in cabins on their ranges close to the herd to protect them from predators (Rattenbury 2006; Pushruk 2017).

While the adoption of snowmachines was relatively rapid throughout rural Alaska (Stern et al. 1980), other methods of wintertime herding did not completely disappear until the 1990s.

2.3.3 Late 1960s-early 1970s: New herds and changing ownership

By the end of the 1960s, the reindeer herds that will be discussed in the following chapters had already been established—namely the Davis herd (Nome), Kakaruk herd (Teller) and Olanna herd. Although all the original owners of these herds have since died, the Davis and Olanna herds have remained within their original owners' immediate families. The BIA also established a demonstration herd during this period, although this was ultimately subsumed into the neighboring Davis herd.

In 1965, the BIA hired Johnson Stalker to run a new government demonstration herd at Nome. During the early 1960s, Stalker had co-owned a short-lived herd with his uncle at Noatak. He drove the last remaining animals from this herd to Nome, stopping at Cape Espenberg to pick

up a loan of deer from the Goodhope herd (Stalker 2001). Several hundred of these migrated back to Cape Espenberg during the herd's first winter, but the following year Larry Davis drove them to Nome again after receiving them as a BIA loan to start a new herd.

Like most reindeer owners of the latter 20th century (Schneider et al. 2005, 40), Lawrence Tingook Davis (1930-2006) was descended from a herding family, having grown up herding reindeer with his father Elmer, a chief herder for the Deering Reindeer Company herd (Davis 2001; Lynch 2018). He had moved to Nome in 1954 and had married Mary Ann Tocktoo, a Nome local from a Shishmaref family. During the mid-1960s, Davis planned to start a reindeer herd together with a business partner, who backed out as plans were being finalized. Undeterred, he began in 1966-67 with 200 Goodhope deer (Davis 2001; Rattenbury 2006, 27-28).

Cheryl Lynch, one of Davis' eight children, describes her late father as a "businessman" and suggests that changes during her childhood years in the 1960s and 1970s necessitated a new approach that placed greater emphasis on money:

> So it became a cash business, versus a barter business. And it's because, you know, with time, you-you're not so isolated anymore and you can't just barter anymore because Western society said no, I want money. And so it changed from—but all of us kids knew it as you get paid. (Lynch 2018)

Developing herding into a "cash business" was difficult during the first years, when the herd was still too small for meat sales. However, opportunities for economic diversification attended Nome's status as a larger, less remote hub community. The Davises initially made money by offering reindeer tours to tourists, but stopped offering these once it was able to generate adequate revenues from meat and antler sales (Lynch 2018). At around this time, the

construction of a reindeer slaughtering/processing plant in Nome facilitated larger-scale meat sales (Stern et al. 1980, 98).

Ward Olanna of Brevig Mission obtained a loan from the nearby Kakaruk herd in 1970. His son Leonard, an adolescent at the time, recalled helping his father separate the reindeer to be loaned to him: "We went to Wilfred Kakaruk's corral by snowmachine. And after corralling and separating and getting the 500 we kind of drove 'em over this way towards—on our side" (Olanna 2003). While the Olannas had an earlier family background in herding, Leonard points out an economic reason for his father's involvement: "At that time I think there was hardly any work and no jobs, to get by with" (Olanna 2003).

Teller's Kakaruk herd was already well established, but its management fluctuated during the years following the 1965 death of its original owner, Johnny Kakaruk, Jr. Ownership passed to Johnny's widow, Ruth Kakaruk, who continued to be heavily involved in its management. Johnny's and Ruth's son, Francis Kakaruk, initially became the main herder, but was killed in a car crash in 1968. Another son, Wilfred Kakaruk (1935-2002), then took over as herder. During this time period, the Kakaruk herd was one of the largest in the region, with an estimated 3,000 animals (Olson 1969, 73). After Ruth Kakaruk died during the mid-1970s, Wilfred "[…] didn't corral or do a reindeer roundup for a couple years. […] Uh, the reindeer kind of scattered […]," according to Jimmy Pushruk (2017). Roger Menadelook similarly suggests that Kakaruk's herding activities were limited during this period: "He wasn't doing very much herding; he was just using 'em as butchering. […] You know, we'd butcher; I'd help him. But not very much herding. Every time reindeer come-come close to Teller we would—we would be able to butcher" (Menadelook 2003). By the mid to late 1970s, the lack of active management reportedly

caused the herd to become increasingly feral and diminish in size. Menadelook (2003) suggests its population shrank to as low as 700 head of reindeer.

2.3.4 1960s-1970s: Institutional changes

As Northwest Alaskans' lives became increasingly entangled with government and commercial services, Alaska as a whole was undergoing steady population and economic growth, particularly in the years surrounding the pipeline boom of the 1970s. These trends reflected the more general growth trajectory of the United States as a whole since World War II (Burch 1975). One of the main consequences of this was that reindeer owners (and rural Alaskans in general) increasingly needed to be involved in politics and to know how to navigate an ever-more complex institutional and bureaucratic landscape. Reindeer herders frequently became community leaders; Larry Davis even served in the Alaska State Legislature in 1975-1976 (Alaska State Legislature 2009, 30).

A variety of institutional changes had direct ramifications for reindeer herding during this time period. The US Bureau of Land Management (BLM) began supervising reindeer ranges and issuing grazing permits during the 1960s, cooperating with the USDA Soil Conservation Service to perform range assessment checks (Stern et al. 1980, 94-95). Most significantly, the 1971 passage of the Alaska Native Claims Settlement Act (ANCSA) had considerable impacts on reindeer herding through its creation of 13 regional and more than village native corporations whose shares were divided among Alaska Native people alive at that time.[14] These corporations injected considerable money into rural Alaska through shareholder dividends, as well as through

[14] In the Nome-Teller area, these included Bering Straits Native Corporation (BSNC), the regional corporation for the Bering Straits region; Kawerak, Inc., the regional nonprofit; Nome Eskimo Community; Teller Native Corporation; the Teller-based Mary's Igloo Native Corporation; and several others representing Nome-based diaspora communities.

economic development initiatives within rural Alaska communities. All regional and most village corporations were deeded large amounts of land as part of the settlement. Herders were now required to obtain permits from corporations in order to graze their reindeer on corporate lands within their ranges. This has typically been a straightforward process but occasionally political tensions between herders and village corporation officials have made it more tenuous.

The Reindeer Herders' Association (RHA), which provides political and economic representation to herders, took its current formation in 1971 as part of Kawerak, the regional nonprofit sister corporation to BSNC. RHA has assisted herders by developing markets, working with government agencies on regulatory issues and providing logistical support to herders. The University of Alaska Fairbanks Reindeer Research Program (RRP) has also supported the reindeer industry through research, training and development initiatives (Finstad et al. 2006).

2.3.5 1970s-1980s: Velvet antler sales, meat sales and increasing profitability

During the 1970s, RHA worked to develop market opportunities for the sale of velvet antler, produced into aphrodisiacs for sale to East Asian markets. Antler harvesting had begun in the early 1960s (Simon 1998, 261), but the price and harvest rates increased dramatically during the early-mid 1970s (Stern et al. 1980). For the next two decades, this formed one of reindeer herders' main revenue sources (Simon 1998, 263), representing a more intense commodification of reindeer than in previous herding history. Not only was a new part of the animal being used on a large scale for monetary exchange, but it was being traded on global markets.

Clearly, the addition of velvet antler as a major herding product made the activity potentially more profitable than it had been in previous decades. Antler production was definitively market-oriented in a way that had not always been true of meat production. This was

reflected not only in its exclusively monetary distribution, but also in the kind of business transactions herders needed to engage in with horn-buyers. Lynch (2018) describes learning to negotiate contracts with these buyers, largely Korean immigrants/nationals living on the west coast of the United States:

> Every year, it was a different contract. And it might be a different person—or, beginning of the season might be one person or, might be somebody else [...] Sometimes we're in Anchorage, dad's in Anchorage looking for a buyer. [...] Dad taught us how to negotiate—how to—what prices to look at—what things to say or do. And-and he also taught us to say, "n—we're done. We're not gonna do it." (Lynch 2018)

In addition to requiring business acumen, herders also needed to develop precise knowledge of when to corral their animals for optimum antler size and condition (Henry 2002; Schneider et al. 2005).

Although reindeer meat never became a globally traded commodity as velvet antler did, the Nome Reindeer Plant offered herders a meat market outside of Alaska from the mid-1970s to the mid-1990s. The processing facility was owned by the University of Alaska but operated by businessman/farmer Welch Brogan. Brogan, who had operated an elk farm near Corwin Springs, Montana since the 1950s, had developed niche markets for domestic and international sales of elk and wanted to expand to other "exotic" meats, including reindeer (Kolman 1999). Welch's son, Mike Brogan, managed the Nome facility, which purchased whole reindeer carcasses from herders throughout the region and processed them for shipment Outside (Charlie Lean, pers. comm., 17 May 2019). Between mid-1970s and the early 1990s, the Brogan operation was reportedly a significant source of meat-sales revenue to many herders in the region.

Alaska Agricultural Statistics (Alaska Crop and Livestock Reporting Service 1987, 38; 1995, 33) indicate that meat sales and "other sales" (i.e. non-meat products sales, almost all of which was velvet antler) generated roughly comparable amounts of revenue during much of the 1980s, as shown in figure 2.1. Finstad et al. (2006:39) acknowledge this, but state: "While the development of the reindeer velvet antler market during the 1970s and 1980s enhanced profitability, most herders believe that meat sales provide the economic backbone for the industry and manage their herds accordingly."[15] A downside of antler sales was that they were tied to global markets, which could be somewhat unpredictable. On the other hand, meat production often entailed considerable expense, while horn-buyers were often willing to pay for much of the expense associated with reindeer roundups. Beach (1985) asserts that the relatively low value of reindeer meat limited its potential as a source of income for herders. He points out that herders were typically from relatively wealthy families with other sources of monetary income. Herders were often inclined to give reindeer meat away or sell it cheaply to relatives and community members, reproducing the social role of *umialik*.[16] Stern et al. (1980) similarly point out that most herders supplemented their herding activities with additional sources of income.

[15] It should be noted that Finstad et al. (2006) were not specifically writing about the 1980s in the context quoted here, but more generally about reindeer herding in the then-present and recent past.

[16] Beach here uses the term "big man"—one gloss of the Iñupiaq term *umialik*—citing Burch 1975 and Paine 1971. Simon (1998) has extensively considered the *umialik* role in early reindeer herding. Olson (1969) and Simon (1998) discuss its continuing applicability into the mid- and late-20th century, respectively. On the other hand, Ellanna and Sherrod (2004:143-148) dispute whether Iñupiat were able to meaningfully establish reindeer *umialik* as a social role, given constant nonnative interference into the development of Iñupiaq reindeer herding.

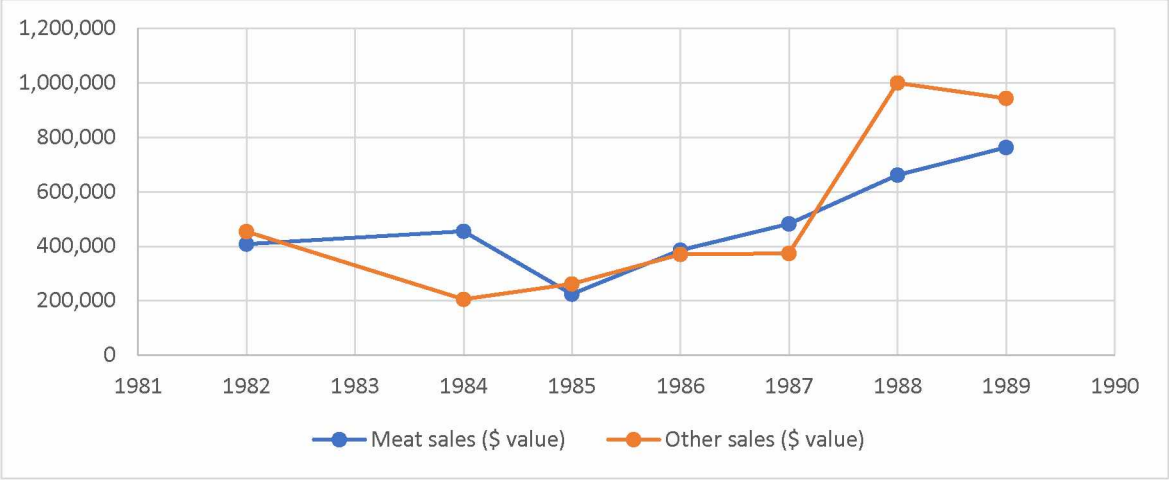

Figure 2.1: USD value of meat sales and other sales (i.e. non-meat) during the 1980s. Velvet antler comprises nearly all the monetary value represented by "other sales" (Source: Alaska Agriculture Statistics 1987, 1995)

However, some herds were clearly quite profitable by the 1980s, and herders' generosity at times involved more monetary forms of giving/exchange. Lynch (2018) describes the conspicuous altruism of her father, Larry Davis:

> […] He had to take care of all of us and-and he not only helped his immediate family but my aunt and their families. Whenever he could, he would help. Um, it wasn't just our family that benefitted from the reindeer herding. I remember this minister really wanted to um, spread the gospel more than just in Nome. And, my dad told him, "well, if you go get your pilot license I'll get you a plane." (Lynch 2018)

In addition to allowing herders to meet social obligations and play the *umialik* role, Lynch's recollection here suggests ways in which herding wealth has sometimes shaped moral economies in the region.

Occasionally, the Davis herd generated revenue from nonconsumptive income sources. During its early years, the herd was used in reindeer tours, as described above, while a decade

later it was featured in the 1983 Disney film *Never Cry Wolf*, in which the animals starred as caribou under chase by wolves.[17]

As velvet antler sales made herding increasingly profitable, herders sometimes began using helicopters to round up their reindeer for the summer handlings at which antlers were harvested (Schneider et al. 2005, 43). The timing of velvet antler harvest seeks to optimize their size and consistency, and horn-buyers were sometimes willing to pay for the costs of helicopter roundups (Simon 1998, 263-64). This helicopter method of herding represented a further step in the mechanization of the activity, as well as requiring highly specialized skills to operate. Most herders could not fly helicopters themselves, but a few pilots emerged in the region who had specialized skills in aerial herding—most famously Donny Olson of Golovin, currently (as of 2019) an Alaska State senator. Larry Davis eventually purchased a helicopter, which he hired a pilot each year to fly (Lynch 2018). Herders also employed fixed-wing aircraft to spot their herds, and some herders (e.g. Clifford Weyiouanna 2002) piloted their own airplanes. The mechanization of herding continued in other ways during the 1980s, as three-wheelers first appeared for summertime herding, followed by four-wheelers later in the decade. However, some herders continued to walk for summertime herding well into the 1990s (e.g. Menadelook 2003).

2.3.6 Late 1970s-1980s: New herd ownership and management

Despite the fact that there was very little unclaimed land available for grazing permits by 1980, several new reindeer owners emerged on the peninsula during the course of the decade.

[17] *Never Cry Wolf* was not the first Hollywood film to feature a reindeer herd from the region. The 1933 film *Eskimo*, filmed mainly at Teller/Port Clarence, featured the Igloo Reindeer Association herd, which was managed at the time by Johnny Kakaruk, Sr.

Leonard Olanna took over after his father, Ward, died in 1982 (Olanna 2003; Olanna 2017). The herd later became defunct due to dwindling numbers of reindeer, but Leonard Olanna received another reindeer loan in 1994 and has continued it since then. Other ownership/management transfers in the region (e.g. Sagoonick, Henry, Goodhope) were commonly from father to son. Tom Gray of White Mountain was able to start a herd during the early 1980s after making a deal with another grazing permit holder, and later obtaining a permit for a newly vacated range nearby. Unlike most herders, Gray did not have a family history of reindeer herding (Gray 2003; Gray 2016).

In 1975, NANA, Inc.[18] began a reindeer herding operation in partnership with Buckland herder Paul Hadley. The operation, Quingniq, began when BIA decided to discontinue its Nome-based model herd, and offered to return to the Northwest Arctic region the 800 reindeer it had originally borrowed for that endeavor (NANA 1975). During the following years, Quingniq acquired thousands of additional reindeer from other herds in the region, building a herd that numbered as large as 10,000 in 1981 (NANA 1981). In the early 1980s, NANA acquired part ownership of the Kakaruk herd (NANA 1983), which had dwindled to fewer than 1,000 animals at the time due to lack of active management (Menadelook 2003). According to Jimmy Pushruk (2017), NANA took over its management for the purpose of rebuilding it, and in exchange was allowed to take 1,000 head of reindeer to the Quingniq herd near Kotzebue, once the Kakaruk herd had become strong enough to sustain these losses. As a corporation, NANA had more money to invest in its herding operations than did individual herders: it had its own helicopter for use in summer roundups and hired salaried herders from Teller to manage the herd intensively. NANA even purchased several Icelandic ponies for summer herding, and hired a Navajo horse

[18] NANA is the regional native corporation for the Northwest Arctic region, which includes the northeastern portion of the Seward Peninsula and the river drainages adjoining Kotzebue Sound.

trainer to teach herders how to ride them (Tingook 2017). However, NANA's herding involvement was unprofitable and relatively short-lived. By the mid-1980s, the NANA-Kakaruk partnership dissolved as a result of financial disagreements, while the Quingniq operation failed due to caribou incursions and high costs (Beach 1985; Okbaok 2017).

NANA was not the only Alaska Native Corporation to become involved in reindeer herding. Sitnasuak, the village corporation for Nome, began negotiating with BIA in 1980 to begin a reindeer project on the former BIA model herd range with a loan of 300 reindeer from the Davis herd. The corporation's shareholder newsletter stated, "Reindeer Project goals revolve around providing local residents with a viable industry that they can identify with, participate in, and enjoy the products of" (Sitnasuak Venture 1980, 4). The project was unprofitable and lasted only a few years. According to one Teller resident, who was employed as a herder for the corporation, "the range was real tough; it's pretty hard to get around in that area" (Tingook 2017). As well, the herd remained small, which reportedly limited its potential as a revenue source and made the animals more difficult to control. After the Sitnasuak herd failed, the neighboring Davis herd acquired its rangelands.

Figure 2.2: The remains of the corral used by the BIA and Sitnasuak herds, about 12 miles northwest of Nome on the Teller highway. Photo by Odin Miller.

Two new Teller-based herds were established later in the decade. Roger Menadelook (1942-2008), from a Diomede family that had moved to Teller during his childhood, worked for NANA during its management of the Kakaruk herd. After NANA ended its involvement with the herd, Menadelook continued to herd for Wilfred Kakaruk, and in 1985 he persuaded the latter to give him a loan in exchange for his work:

> You know he never did pay me very much, so I asked him for a loan. I asked Wilfred, how 'bout if you just give me a loan of 500 reindeer? So, so he gave me a loan of 500 reindeer; that's how I got started. But in the meantime, while I had that herd, that 500 reindeer, I still helped Wilfred (Menadelook 2003).

The following year, Menadelook moved his reindeer to a newly-acquired range on the upper Kuzitrin River.

In 1989, Teller herder James ("Jimmy") Noyakuk began a new herd together with his uncle, Arthur Tocktoo of Brevig Mission, who had a vacant range on the north side of Imuruk Basin, east of Teller. Tocktoo had owned a short-lived herd during the 1970s (Rattenbury 2006, 28), and both he and Noyakuk had frequently herded for the Davises (to whom they were related) during this time period (Lynch 2018). Rattenbury (2006, 28) reports that Noyakuk became interested in starting his own herd after observing the profitability of antler sales during his work for the Davis herd. Although Noyakuk had started the herd as a joint venture with Tocktoo, Noyakuk did most of the herding and acquired full ownership of the herd in 1993.[19]

2.3.7 Herding activities and community involvement, late 1960s-1980s

As we have seen above, herding grew gradually more profitable during the latter 20th century; some more recent sources have emphasized its role within the monetary economies of herding communities (Carlson 2005; Finstad et al. 2006). Yet all throughout this period, nonmonetary exchange continued to be an important component of reindeer herding economies in the region.

In general, herders during this period rounded up their animals an average of two times per year: once in the wintertime for vaccinations, and once in the summertime for antler-cutting, eartagging/earmarking and vaccinations (Finstad et al. 2006, 38). Herders commonly slaughtered their animals at the corral during winter roundups, although field slaughters were also common, in which they used firearms to butcher animals in the open tundra. Large herds such as that of the Davises often completed up to three roundups each summer, as they could only handle part of their herd at any one time (Okbaok 2017).

[19] See Rattenbury (2006) for a specific account the Noyakuk herd.

In villages, roundups continued to be large events attended by much of their home communities, and nearby communities as well. Teller residents commonly attended roundups for the Brevig-based Olanna herd as well, while Brevig residents would attend the Kakaruk roundup. Pushruk recalls:

> Every spring we would go up to uh, Canyon and our—be with our Uncle Wilfred and help with the reindeer roundup—the spring reindeer roundup. […] And uh, be like the whole—the whole community would—you know—Brevig and Teller, they would—both villages would go out to go help (Pushruk 2017).

As Pushruk implies here, roundups were large events requiring considerable labor forces. Yet their role as community gatherings also meant that many locals attended to observe and socialize without becoming heavily involved in the work. Herders compensated roundup workers for tasks, typically in meat but sometimes in money. Additionally, herders were generally expected to provide food for all who attended the event. Sometimes they gave attendees gifts of reindeer products. One herder with whom I spoke said that he did not publicize roundups because he did not have a large enough herd to sustainably give the amount of meat commonly expected at large gatherings. Because of Nome's large size, Davis roundups did not have the same significance as community-wide events that those in Teller and other small villages often did.

Roundup labor included roles such as reindeer wrestlers, castrators, antler-cutters, and people to control the flow of the animals being processed. Children learned to handle reindeer by wrestling fawns. A crew of people commonly helped push the reindeer herd the final distance into to corral. There were also many support tasks, such as cooking, cleaning and shuttling supplies back and forth from the village. In addition to community members, staff from the RHA

and RRP also attended roundups, keeping tallies of the animals and helping with tasks such as vaccination. RHA invited all herders in the region to attend each roundup as interested observers—giving them a chance to ensure that any stray reindeer with other herders' marks were handled according to range rules.

During other times of year, active herders often employed a few community members on an as-needed basis for tasks such as moving the reindeer, field slaughter, etc. Most typically, those employed were relatives or close friends of the herders. In this way, families connected with reindeer herding had the most direct access to its economic benefit (Simon 1998; Stern 1980). Assistants were variously paid in either meat or money, depending on their needs and the herder's resources at the time. NANA's employment of salaried workers in its Kakaruk herd management was somewhat unique in the region.

As a source of income and a means of producing goods, reindeer herding was surely a larger part of community life in Teller than in Nome. Nome's population at the time—approximately 2,300 according to 1980 census data—was more than ten times larger than that of Teller (Schroeder et al. 1987, 122). Moreover, Teller had three established reindeer herds by 1990, while Nome was left with only one after the end of the Sitnasuak operation. Although Kakaruk herding activities reportedly underwent a lull during the 1970s, as discussed above, the herd was managed much more intensively during and after NANA's involvement (Fosdick 2016; Menadelook 2003). Finally, the Davis herd's large size did not mean that it had dramatically greater labor requirements than smaller herds based in Teller and Brevig Mission.

In fact, the Davis herd regularly employed herding assistants from Teller. By the 1980s Teller had become a hub of reindeer herding knowledge and activity. The community had one of the longest and most established herding traditions in the region, as well as probably the largest

number of herds in its vicinity. A number of men in the community with whom I spoke—particularly those born around 1960—were regularly employed in reindeer herding work during much of the late 1970s-mid 1990s. It seems that Teller developed an elite group of roughly 5-10 reindeer men whose knowledge skills were in demand throughout the region. Each year, they would travel to a number of different herds throughout the Seward Peninsula to assist in corrallings (Okbaok 2017; Tingook 2017).

2.3.8 Meat distribution and consumption during this period

As we have seen, many herders during this period were motivated by economic possibilities—both informal ones like generosity in sharing, and increasingly in the formal economies of earned income. Nonherders were also involved in reindeer herding economies, but primarily as consumers rather than producers. Chief among the goods they consumed was reindeer meat, which herders commonly used as payment for reindeer herding help (Stern et al. 1980; Simon 1998). Reindeer meat was a staple in village grocery stores and was generally sold at lower prices than imported meats such as chicken or beef (Stern et al. 1980).

Reindeer herders continued to give away meat during this period, or to pay it in exchange for labor, but they sold increasing amounts of it as well. With some exceptions, such as the Nome Reindeer Plant (discussed above), these sales remained primarily local and regional (Stern et al. 1980; Finstad et al. 2006), partly due to health inspection requirements that made Outside distribution more expensive and logistically complex (Noyakuk 2017). According to my sources in Teller, the 1970s were also the beginning of commercialized reindeer hunting in the Kakaruk herd, or "selling tags" (Anon. 2018), a practice that involves paying a reindeer owner for permission to shoot, or "butcher," a reindeer on the tundra. Institutionalizing and monetizing

individual, personal-use butchering was a way to capitalize reindeer without requiring major investments of time or resources from the herder. Permission to butcher was also sometimes traded in exchange for services. One participant said that his father would frequently give the Kakaruks taxi rides between Nome and Teller, and that they would pay for this service by giving him reindeer tags. Personal-use reindeer butchering—both with and without owner permission—was not new during this time period, nor was it altogether unique to the Kakaruk herd. Olson (1969, 119) suggests that herders often tolerated unauthorized hunting as per Iñupiaq values of generosity with resources. One interview respondent said that his father often harvested reindeer from a nearby herd, and would later inform and pay the herder, who was a close family friend (Ashenfelter 2018). Similarly, a few participants said there was a general understanding that community members had standing permission to hunt reindeer in case of household food shortages.

Although reindeer meat was commonly paid in wages and sometimes given away, it was also widely available for purchase at local grocery stores throughout the region. In the late 1970s it was slightly cheaper than beef and chicken, on average (Stern et al. 1980). In Nome, grocery store distribution was especially prominent. The Northern Commercial (now AC) grocery store had sold reindeer meat in Nome during the 1950s and 1960s, but by the 1970s a store called US Mercantile was the main retail source for reindeer products, according to Howard Farley. Farley had originally been the butcher for Northern Commercial, but moved to US Mercantile during the 1960s or early 1970s, and continued working there till its closure in 1982. US Mercantile (figure 2.3) frequently purchased reindeer from the Davises, and more occasionally from the Kakaruk herd and other herds in the region. When he began working at US Mercantile, Farley says that the store mainly sold reindeer to Alaska Native customers as stew meat. US Mercantile

developed a nonnative market after Farley began producing steaks and roasts, which he priced higher to enable cheaper stew meat sales. The store also sold reindeer hearts, livers and heads, as well as other Native foods.[20] According to Farley, it never produced hamburger or sausage because of the added labor costs associated with deboning the meat. After US Mercantile closed, Farley bought and sold reindeer meat for several years through a business called the Locker, which rented public freezer space to customers (Howard Farley, pers. comm., 4 March 2019).

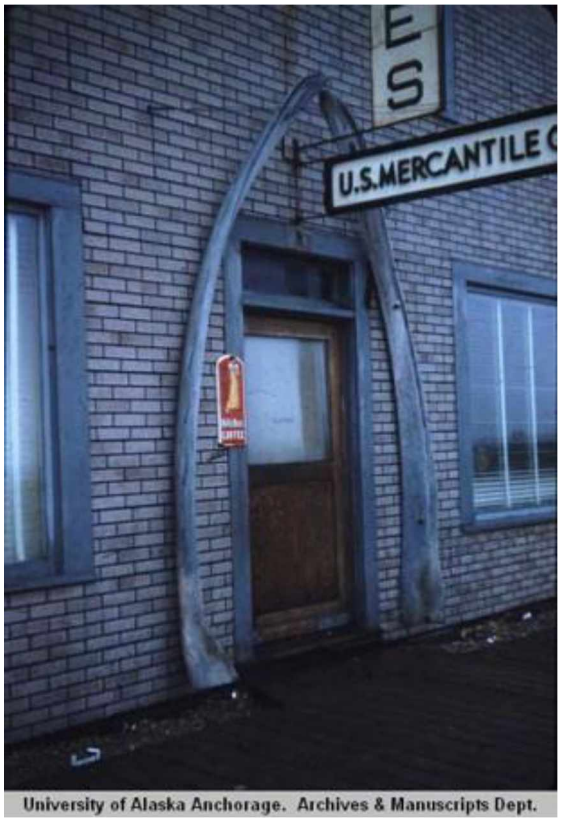

Figure 2.3: US Mercantile storefront. Photo courtesy of University of Alaska Anchorage Archives & Manuscripts Dept.

[20] In particular, US Mercantile is remembered for selling marine mammal products, which it often purchased from Diomede and other communities in the region. On one occasion, Farley salvaged *muktuk* (whale blubber) from a dead whale on a beach near Point Hope, washing it with Mr. Clean in order to remove signs of weathering. Both Farley (who is non-native) and another participant clearly stated that the store continued to buy and sell marine mammal products even after the passage of the Marine Mammal Protection Act of 1972, which imposed restrictions on the acquisition and use of marine mammal products commercially and by non-natives. However, Farley stated that he was careful to follow the law, and stopped hunting marine mammals, himself, after its passage.

At least one Nome restaurant offered reindeer on its menu during this time period: Milano's (which is still open as of 2019) served a reindeer teriyaki dish during the 1980s (D. Roy Mitchell, pers. comm., 28 February 2019).

In Teller, reindeer meat was available at the Teller Native Store, sometimes as quarters rather than as individual, packaged cuts of meat. One participant explained that people who purchased reindeer meat from the store often had work or other commitments that made it impractical for members of their household to butcher reindeer themselves (Anon. 2018). During the 1980s and 1990s, Wilfred Kakaruk had a warehouse from which he sold reindeer carcasses. Throughout the region, reindeer meat was commonly distributed at community events such as holiday celebrations and potlatches. Its consumption was not limited to Alaska Native spaces and events; it could also be found at some restaurants and community events in Nome.[21]

According to Stern et al. (1980), residents of the Seward Peninsula consumed 36 pounds per capita of reindeer meat in 1976 (an amount quite similar to what my data suggest Teller residents use today; see 4.2.2). These figures include the hub communities of Nome and Kotzebue, which both have far higher nonnative populations than do villages in the region. On this basis, Stern et al. (1980) speculate that reindeer meat consumption rates may have likely been higher among Alaska Native families in Nome and Kotzebue than in surrounding villages because nonnative families may have been more likely to purchase other store-bought meats. By contrast, many Alaska Native families living in these hub communities might have had less

[21] My uncle, who worked at a gold dredge in Nome during the 1980s, recalls that reindeer meat was served on a weekly basis as part of the meal service for the man-camp there (Gregg Conitz, personal communication, 11 April 2018).

access to subsistence foods than those in villages, and thus have been more likely to purchase reindeer meat.

Although individual reindeer owners were often motivated to become involved in the activity due to factors such as economics and family history (Schneider et al. 2005), concern for the long-term stability of rural Alaska's food sources also spurred regional interest in herding. As NANA made plans to begin its reindeer herding venture, its then-President John Schaeffer described it as a food security initiative rather than a money-making venture: "It's a bad investment in terms of making money for stockholders, because at best you might make a profit in 20 years." But, he stated, "It will assure our people don't starve; don't go without food in the future" (NANA 1975). NANA's foray into reindeer herding began as the WAH population was approaching a historic low, and as rapidly expanding oil infrastructure on Alaska's North Slope was spurring anxieties about the future viability of caribou herds. In fact, state and federal officials at the time briefly pushed a plan to establish reindeer herds on existing caribou range in the North Slope, according to environmental historian Ken Ross (2000, 59).

2.4 Return of caribou, 1980s-present

2.4.1 1980s-1990s: Gradual caribou appearance on eastern Seward Peninsula

As we have seen, the 1970s and 1980s generally marked a period of stability, sustained growth and increasing prosperity for Seward Peninsula reindeer herding. By contrast, decline and instability have been the prevailing characteristics of reindeer herding since then. The reappearance of caribou on the Seward Peninsula, and the accompanying loss of reindeer, was a rolling event that unfolded in an East-West direction over a number of years: even as some herds

underwent total loss, those in other areas continued to thrive during the early years of caribou incursion.

For the 20 years between 1976 and 1996, WAH grew continuously. It more than doubled from 75,000 in 1976 to 175,000 in 1982; and doubled again in the following six years, to 343,000 in 1988 (Western Arctic Caribou Herd Working Group 2010). During the course of the 1980s, WAH expanded its winter range southward onto the Baldwin Peninsula and the northeastern Seward Peninsula. NANA's Quingniq herd began sustaining major losses during the first half of the decade (Beach 1985), and had lost most of its animals within a few years. In the few years that followed, herds associated with Buckland, Deering and Koyuk began experiencing major caribou incursions. During this time, some herders on the western Seward Peninsula occasionally noticed isolated caribou mixing with their reindeer (Okbaok 2017; Schneider et al. 2005, 43).

Most herders report being able to separate or cull small numbers of caribou within their herds, although even these can be disruptive, as their skittish behavior tends to spread to normally calm reindeer (Finstad et al. 2006, 40). When large numbers of caribou are in the same vicinity it is almost impossible to control domestic reindeer herds—even those that are quite tame and closely managed. The latter typically join migrating caribou, leaving their ranges and quickly becoming feralized (Finstad et al. 2006; Schneider et al. 2005). Normally, herders can avert losing their reindeer herds only by keeping them separate from migrating caribou.

Caribou migration on the eastern Seward Peninsula continued to increase, with Buckland and Koyuk herders losing their entire herds to caribou migration by the mid-1990s (Finstad et al. 2006, 41). During this same time, herds associated with Nome and Teller continued growing. In this way, the status of reindeer herding during the late 1980s through mid-1990s was a dynamic

bifurcation between herds that had not yet been disrupted by caribou migration and those that had. Among the former group, the practice of herding looked much as it had during the 1970s and 1980s. In fact, the reindeer industry's economic output peaked at the beginning of the 1990s, as statewide animal population reached levels not seen since the 1950s (Jernsletten and Klokov 2002, 76).

Among herders who had not yet suffered direct impacts from caribou, responses varied to their advances onto the peninsula. During the early 1990s, Tom Gray decided to pay back the BIA reindeer loan he had received a decade earlier after seeing the losses by herders to his East:

> At the time I paid back I could see the problems coming on with the caribou. So I wanted to pay back so I wasn't holding the bag with not enough animals to pay back. [...] When I made my payback to BIA, and Leonard Olanna wanted my animals, people were hunting caribou in Fish River flats. I mean that's how serious—I mean they were within 40, 50 miles of me. And I could see the handwriting on the wall (Gray 2002).

Within a year after paying back this loan, Gray began to suffer major losses. He was able to preserve some of his animals by retaining them on an isolated peninsula during months when WAH was nearby. Yet his herd continued to dwindle in size until around 2007, at which time he decided it was no longer economically feasible to herd his 100 remaining reindeer (Gray 2016).

As of the mid-1990s only small numbers of caribou had been seen in the Nome-Teller area, and the WAH's main winter range was still in the Nulato Hills to the east of the Seward Peninsula. Some herders in the West continued investing in the reindeer industry well into the 1990s. Larry Davis began construction on a large slaughtering plant facility at his property. As Gray suggests, the 500 reindeer he paid back to the BIA were loaned directly to Leonard Olanna,

who had lost his herd during the 1980s for reasons apparently unrelated to migrating caribou (Olanna 2003). At around the same time the Blodgetts, a prominent Teller family during much of the 20th century, acquired a small number of reindeer. However, no rangelands were available at that point. After unsuccessfully attempting to raise the reindeer in a garage, the Blodgetts eventually merged their animals with the Olanna herd (Okbaok 2017).

2.4.2 1980s-1990s: Caribou experience among nonherders on the western Seward Peninsula

Until the 1990s, direct human experience with living *Rangifer* on the western Seward Peninsula was mostly limited to reindeer, although Indigenous knowledge of caribou had been preserved since their disappearance in the 19th century. As caribou became increasingly present in the Kotzebue area and the eastern Seward Peninsula, experiences with them began to increase within the region as a whole. Roy Ashenfelter (2018), who spent childhood in White Mountain, recalls hunting for caribou in Death Valley, in the east-central part of the Seward Peninsula, as far back as the early 1970s. White Mountain hunters sometimes encountered stray reindeer from the Golovin-based Aukunguk herd among these caribou, which they recognized and shot because they preferred the meat (Ashenfelter 2018). Magdanz and Olanna (1990) report quite high levels of caribou harvest from Golovin (132 pounds per household) and Shishmaref (227 pounds per household) during 1988. Caribou hunting from the latter community entailed a 100-mile trip, but caribou was a "preferred meat" (Magdanz and Olanna, 1990,10). Nome hunters also traveled to the eastern peninsula to hunt caribou. But this was a long, costly and logistically difficult trip at the time, as one Iñupiaq caribou hunter from Nome explains:

> [...] the real adventurous person you know, um—you know, in the '80s, and if you wanted to access caribou—it meant a fairly long trip, generally—you know, you're

> talking the headwaters of Kuzitrin River, headwaters of Koyuk River over that area. Um, so it is a fairly—a fairly lengthy trip, you know, and you know, mid-'80's, the snowmachines, they were not what they are today. Um, you know, you basically had to bring a whole number of spare parts with-with you back in the '80's [...] if you were hunting by snowmachine. Nowadays you can go, several years without ever even replacing a part on these, you know, extremely reliable snowmachines. (Ahmasuk 2016)

Hunting trips by snowmachine was not the only way that residents of this area were exposed to caribou as they gradually moved toward the area. Bering Straits Iñupiat commonly have family connections throughout the region, and many have, themselves, relocated during their lifetimes (Burch 1975). As a hub community, Nome in particular has residents who originated in communities throughout the region, some of whom frequently return to visit their home village. Moreover, subsistence products are commonly exchanged among large, inter-community networks in rural Alaska. Accordingly, while exposure to caribou and its products was limited on the southwestern peninsula during this time period, it was not exceedingly uncommon. Results from a community wildlife survey covering 1988 indicate no households in Brevig Mission hunting for caribou during that year, but nearly 27% of households having or using caribou products (Magdanz and Olanna 1990, 40).

It should also be noted that growing moose-hunting opportunity also played a role in shaping human relationships to large land mammals during the 1970s-1990s (Dau 2000). Before the arrival of moose in the mid-20th century, reindeer was essentially the only large ungulate present in the region. By the 1980s, many residents of Nome and other communities depended

heavily on moose (Ahmasuk 2016). Musk ox were introduced in 1970, but no hunting for them was allowed till 1996 (Dau 2000, 60).

2.4.3 1990s-2000s: Major declines in reindeer herds as WAH winter range expands westward

From the late 1980s through the mid-1990s, WAH continued to grow, albeit at a slower rate than it had during the previous decade. Its population reached a historic high of 463,000 in 1996 (Caribou Trails 2010). Large caribou herds require more pasture than do smaller ones, and so characteristically have longer migration routes (Burch 2012). As WAH grew larger its winter range continuously expanded to the South and the West.

In autumn 1996, as many as 100,000 caribou migrated onto the Seward Peninsula (Finstad et al. 2006, 41). This pattern has continued and intensified in the years since: the peninsula has gradually supplanted the Nulato Hills as WAH's primary winter range (Burch 2012, 88). Several herders lost a majority of their animals during the winter of 1996-1997, a situation aggravated by late freeze-up conditions that inhibited snowmachine access to their reindeer. Most of the affected herds were on the eastern half of the peninsula or Norton Sound (Gray, Karmun, Sagoonick), but Roger Menadelook's range in the central-western interior was directly in the path of the WAH migration route (Finstad et al. 2006; Schneider et al. 2005; Oleson 2005).

Some herders greatly intensified their herding efforts, attending their animals on a near-daily basis. They employed strategies such as moving their reindeer to caribou-free parts of their ranges, culling caribou that had mixed with their herds, and even pushing advancing caribou aggregations away from their reindeer grazing areas. Tom Gray tried this latter strategy but ultimately found it futile: "[…] when the caribou start coming, I've tried to explain to people it's

like trying to go out here at the edge of the ocean, and trying to stop that ocean from coming in—the tide coming in" (Gray 2016). While herders generally recognized the need for closer monitoring, loss of animals translated directly into loss of herding revenues, making it more economically tenuous to invest greater amounts of time into the activity (Rattenbury et al. 2009).

In fact, caribou incursion was not the only economic factor working against reindeer herders during this time period. Velvet antler prices dropped significantly during the mid-1990s as a result of oversupply from post-Soviet Russia, the introduction of synthetic aphrodisiacs, and a South Korean ban on imports (Carlson 2005, 38-39; Koskey 2003; Jernsletten and Klokov 2002, 79).

Continued technological development made it possible for herders to monitor remotely the unfolding movement of their herds, along with those of WAH animals. In the late 1990s, RRP developed and deployed a satellite telemetry monitoring program to which herders could subscribe. Participating herders collared a few dominant females within their herds, and readings of their coordinates were taken at several-day intervals. Herders could access maps showing their locations via the internet (Finstad et al. 2006, 45).[22] ADF&G also used radio/satellite collars to track animals within WAH and other herds, and (at that time) shared this information with reindeer herders.

Between 1997 and 1999, caribou migrations onto the Seward Peninsula of 50,000 to 100,000 animals occurred each fall. Most of Menadelook's remaining 600 reindeer were lost to caribou migrations in 1999, as were reindeer belonging to herders in Deering, Shishmaref and Shaktoolik (Finstad et al. 2006; Schneider et al. 2005; Oleson 2005). Herders were occasionally able to spot and retrieve reindeer, typically via helicopter, during a short period of time after they

[22] This program was discontinued in 2018 after several years of state funding cuts significantly decreased revenues going to UAF.

had been recruited by caribou. Helicopter charters are costly, however, and Menadelook explained that the changing economics of reindeer herding had precluded this option for him: "That first year the caribou came into my herd, I had about 600 reindeer left, and I couldn't—I couldn't go get 'em 'cause the market was so low, that I couldn't use a helicopter to round up the deer. Otherwise I could've—I could've got that herd" (Menadelook 2003).

Noyakuk, whose herd had peaked in 1996 at roughly 1,000 animals, had lost about half of these by the end of the decade (Rattenbury 2006, 33). In fall, 2000, Noyakuk lost his remaining reindeer as more than 200,000 caribou migrated onto the central Seward Peninsula and through his range. Later that year he was able to recover 150-200. During the following several years he engaged in relatively intensive herding, but his low herd population made this economically tenuous (Rattenbury 2006, 36). Larry Davis lost up to half of his 6,000 reindeer during this same fall caribou migration. The Davis herd's larger size meant that it was still economically viable at this reduced size, and initially it fared better than herds to the north and east of it. As of 2004, it still had an estimated 3,500 animals: way down from its 1997 high of 6,000, but still larger than most herds in the region had ever been (Finstad et al. 2006, 41). The Kakaruk herd suffered very little caribou interference, as it largely grazed on the coastal forelands to the south of Port Clarence, separated from WAH migration by natural boundaries such as the Kigluaik Mountain (Okbaok 2017).

By the early 2000s, herders such as Davis generally expressed pessimism about the future of reindeer herding:

> When the caribou come and take these things away it's gonna have a real impact because, there goes an industry that's just in its infancy, you know. Just getting started up here. And now that we know a little bit business-like how to do it. [...] And there you feel so

> helpless. What can you do, you know? […] I hope that we can save the industry but right now I don't see any way we could do that, ah, because once they're—caribou and as large as the herd is right now, they're gonna keep coming, coming and coming (Davis 2001).

Climate change also began having significant impacts on the relationships between humans, reindeer and caribou during this period (cf. Cassidy 2012). Herders more frequently had difficulty accessing their herds due to weather conditions that made travel unsafe or impossible—for example, late freeze-ups and marginal ice conditions. In some cases, such conditions prevented herders from moving their herds away from migrating caribou (Rattenbury et al. 2009).

2.4.4 1990s-2000s: Changing community relationships to caribou and reindeer

Although the return of caribou to the Seward Peninsula was devastating to herders, people not closely connected with reindeer herding often viewed it as a positive event. While acknowledging the difficulties WAH expansion presented for reindeer herders, Nome resident/historian Nancy Mendenhall generally portrays the return of caribou as a benefit to the community:

> One again, Nature sent a happy surprise to the region. Just as moose had mysteriously arrived in the Sixties, suddenly one day in the fall of 1996, travelers on the Kougarok Road were awed by the sight of thousands of caribou in migration, moving past Salmon Lake. According to records, caribou had not been seen this close to the coast since the

> 1870s. Hunters exulted and cleaned their rifles; reindeer herders were less ecstatic—wanderlust took little encouragement to bloom again in a reindeer's head. (Mendenhall 1997, 90)

Not only did caribou presence pose an existential threat to domestic reindeer herds, but it also weakened their cultural position within communities with good access to caribou (Beach 1985). *Rangifer* meat had always been culturally important to the Bering Straits Iñupiat; for several generations, the main source of this meat had been privately-owned livestock. Yet reindeer herding had never brought about large-scale cultural change in the region (Simon 1998). Hunting wild animals continued to define Iñupiaq culture, identity, economy and food systems to a far greater extent than did herding domestic ones. The return of caribou provided widespread opportunity to obtain *Rangifer* products through hunting. Furthermore, obtaining caribou meat does not typically require direct cash purchases, while obtaining reindeer frequently does. Despite the considerable costs associated with hunting, then, caribou meat is more often perceived as "free" (For a more in-depth discussion of this, see 4.3.4: Economic interests of herders and nonherders).

Caribou presence changed community relationships with reindeer in other ways as well. Once reindeer began migrating with caribou and could no longer be controlled by herding, their social recognition as domestic stock immediately declined. Personal-use reindeer butchering had long occurred in Northwest Alaska, even when it countervailed herders' wishes (Olson 1969; Ashenfelter 2018). However, it had been limited by widespread acceptance of reindeer as private property within most communities. After domestic reindeer herds were recruited by migrating caribou, some caribou hunter preferentially shot feralized reindeer because they favored the taste

of reindeer over caribou.[23] In some cases, hunters claim to have shot hundreds of reindeer in this way (Beach 1985, 11). The decline of reindeer herds also resulted in the decline of herding activities like roundups as a common part of community life in Northwest Alaska.

The trends described above did not have the same impact on the communities on the western fringe of the Seward Peninsula (Teller, Brevig Mission and Wales) because caribou did not migrate as near to these communities. During my research in Teller, many respondents made comments indicating that caribou has never been particularly important there, sometimes noting that Brevig residents hunt more caribou. By contrast, reindeer has never lost its prominence as a food source to Teller residents. Although the Noyakuk and Menadelook herds suffered severe losses to caribou, the Kakaruk was impacted only minimally. Of the three herds, the Kakaruk herd had always been the largest, the closest to Teller, and probably the most consistent as a source of food for its residents.

The commercial efficacy of reindeer meat production experienced other difficulties that were unrelated to caribou. The Nome Reindeer Plant, which had been an important meat buyer for reindeer herders in the region (as discussed in 2.3.5), began suffering setbacks in the early 1990s, when the US Food and Drug Administration changed its regulations, disallowing out-of-state sales of reindeer carcasses that herders had slaughtered and dressed in the field. The Brogans redesigned their plant in an effort to meet the new regulations, and began purchasing live reindeer from the herders transporting them to the facility by truck and slaughtering them on-site. Longtime Nome resident Charlie Lean recalls that even after redesigning the facility, the Brogans found it "next to impossible" to meet the new regulatory standards (pers. comm. 17 May 2019). On New Year's day 1995, plant manager Mike Brogan and another employee

[23] As I will discuss further in chapter 3, many western Alaska hunters report that they are able to differentiate reindeer and caribou based on their physical characteristics.

perished in a fire that destroyed the facility (Kolman 1999). It was eventually rebuilt and is now run by Norton Sound Economic Development Corporation (NSEDC), mainly as a seafood-processing facility.

An effort to operate a processing facility in Teller also encountered regulatory difficulties. In the late 1990s and early 2000s, Kawerak funded the construction of a meat processing plant in Teller, which opened in 2001. The plant purchased reindeer carcasses from herders in the area and sold meat products on-site. In addition to cutting and packaging meat, the plant produced cured meat products such as sausage, jerky and hot-dogs, using recipes from Anchorage-based Indian Valley Meats (Okbaok 2018). A number of Teller residents with whom I spoke expressed fond memories of the sausages, in particular. Local hunters also paid the plant to process their game meat. The Alaska Department of Environmental Conservation ordered the facility to close after only one year of operation because it had not met the meat inspection certification requirements for retail meat sales (Rose Fosdick, pers. comm, 5 November 2018). Teller locals have also mentioned that the plant had infrastructural problems: because Teller does not have a municipal water system, it relied on a water tank that was inadequately small (Okbaok 2017).

In Teller and other communities where reindeer herds still existed, local involvement with them was also shaped by ongoing cultural change in rural Alaska. In many cases this change can be viewed as a continuation of long-term, ongoing processes such as sedentarization. While virtually all rural Alaska residents were based in permanent villages by the 1980s and 1990s, some still lived in camps for months at a time. Reindeer herders in the 1980s and 1990s commonly had cabins on their ranges and would camp in the tundra for weeks at a time during fawning season. Among younger generations, camping for extended periods of time was

becoming an increasingly uncommon part of life in Northwest Alaska. One research participant, a relative of the Kakaruks who was born in the early 1980s, described his generation as the last one to grow up camping out at the reindeer corral for a week or more at a time. Not only were reindeer herds in the area declining, but so were some Iñupiaq lifeway patterns that had facilitated herding in the past. Dan Karmun, Executive Director of the RHA during the 1970s and 1980s, describes the tension between modern life and the requirements of reindeer herding:

> Of course, the younger generation of reindeer herders are so accustomed to living in the city now. We have so many things to depend on that distracts us from proper reindeer herd management today. They'd rather live in the comfort of water and sewer, TV. Name it, they got it today. You know that's what I see the difference between the early-day herders and today's herders (Karmun 2001).

Herb Karmun (2000), a herder from Deering, similarly suggests that community participation in roundups has suffered as a result of changing culture and technology: "Everything's too high speed now. You can't enjoy yourself, even rounding up. You gotta rush home. Nobody thinks of camping anymore. You just, rush out and, I guess watch money and hide football [*sic*]. That was a bad change, I think" (Karmun 2000).

These patterns of change have been complex and uneven. Subsistence activities have continued to form an extremely important part of culture in Northwest Alaska, particularly in the villages. Although camping on the tundra is less common than ever before, many families still stay at fish-camps with cabins for periods of time during the summer months. However, both communications and transportation technologies have created higher frequency interconnectivity (and the social expectation of it) between the tundra, the village and the rest of the world.

2.4.5 2000s-present: Remaining enclaves of reindeer herding

The first decade of the 2000s saw the passing of most of the late-20th century Nome/Teller-based reindeer owners: Wilfred Kakaruk died in 2002,[24] followed a short time later by his wife, Cathy. Cancer claimed the lives of Larry Davis in 2006, and of Roger Menadelook two years later. Of the original/longtime grazing permit holders in the area, only Jimmy Noyakuk remained, as well as Leonard Olanna in neighboring Brevig Mission. By 2007, Noyakuk had too few reindeer to justify continued herding, and he merged his remaining animals into the larger Kakaruk herd, although retaining them under his own earmark (Noyakuk 2017). On the Seward Peninsula itself, this meant that only four distinct herds were left: Davis, Kakaruk, Olanna and the Wales-based Ongtowasruk herd. However, to the present day all late 20th century herders in the region—or the immediate family memers of those who have died—have maintained their grazing permits even in the absence of herds.

After Larry Davis's death, the herd's population declined considerably. Caribou have been blamed for much of these losses, and some locals have also pointed to the fact that the herd's management was relatively passive during this period. I have heard many reports that community members often butchered reindeer without owner permission. In this way the herd continued its long-time role as a local food source, although during this time period it more closely resembled a hunting system, regulated only through social customs that were not clearly defined. This was further confounded by the herd's proximity to caribou: the Davis herd often grazed on areas flanking the Kougarok Road, which was also the main access corridor for

[24] Many Teller locals have told me that on the day of Kakaruk's death, hundreds of reindeer approached the community, reportedly a highly unusual occurrence which locals have suggested was a showing of respect.

caribou hunters from Nome. While the reindeer were supposedly concentrated to the south of WAH winter range, the hands-off management and the prevalence of reindeer butchering by the general community decreased the social recognition of any ostensible boundaries between the wild herd and the domestic one.

Family members grew increasingly concerned about the future of the herd, and requested in 2010 that Bruce and Ann Davis take over its management. As the oldest of Larry Davis's eight children, Bruce had been actively involved with herding until the mid-1980s, when he had left the Nome area and begun a career as an electrician. The Davises completed a roundup shortly after taking over the herd, but were only able to locate and corral some 500 reindeer, down from an estimated 3,500 in 2004. They spent much of the following several years building and maintaining the infrastructure on their property, such as replacing their old corral, which had been built in the 1960s and was no longer usable.

After the deaths of Wilfred and Cathy, the Kakaruk herd was inherited by another relative, who passed away only a few years later. The herd was then passed to three heirs, and the ownership gradually became even more plural as more people bought or were given stakes in the herd. Management among the various owners became increasingly uncoordinated. Annual roundups continued till around 2008, but were eventually discontinued, partly because the corral was ageing and experiencing considerable erosion problems (Pushruk 2017). During the following years, the herd saw little active management.

During the course of the past few decades, BIA has gradually scaled back its involvement with the reindeer industry. In many cases this has meant an incremental reduction in the support services that had been available to reindeer herders during much of the 20th century (Finstad 2018). Herders often report that it is more difficult to secure government grants for projects such

as building corrals. In 2004, BIA ended its reindeer loan program, as it could not afford to cover the cost of all the loaned reindeer that had been lost during the 1990s and early 2000s (Oleson 2005, 8).

After reaching a peak of 490,000 animals in 2003, WAH began a gradual trajectory of decline. In 2011 its population was at 325,000; two years later it had fallen to 235,000. This did not significantly mitigate use of the Seward Peninsula, however, which gradually became the herd's main winter range. During the past decade, much of the herd has wintered in the upper Kuzitrin River valley and on the peninsula's northern coastal plain (Western Arctic Caribou Herd Working Group 2018).

2.5 Chapter 2 summary

Although reindeer are a relatively recent introduction to the Seward Peninsula, their historical significance to Bering Straits Iñupiat is deeply rooted. This owes not only to familiarity with reindeer herding in Siberia and its products (Simon 1998), but also to thousands of years of experience with caribou in the region (Ray 1975; Burch 2012). For nearly an entire century after reindeer introduction, caribou were completely absent from most parts of the Seward Peninsula. One consequence of this was that human relationships to reindeer evolved in isolation from those to caribou in the region.

Throughout its history, Alaskan reindeer herding has been variously seen as a food security solution for rural Alaska, as an opportunity for economic development, as an agent of social change and/or as a part of the region's ethnohistory. During mid- to late-20th century, cash economies played an increasingly larger role in rural Alaska. Reindeer herding gained increasing potential as a money-making venture during this time, particularly as velvet antler markets were

opened in East Asia. Several new herds were started in the Nome-Teller area between the 1960s and the 1980s, spurred partly by this economic opportunity. At the same time, food security concerns informed some of the interest in reindeer herding within broader communities and institutions.

During the last 30 years, human-*Rangifer* relations have changed dramatically with the return of caribou: hunting, rather than herding is once again the dominant mode of interaction. Reindeer domestication has become far more tenuous, and most herds have been lost to caribou. The presence of caribou has also likely lowered the degree to which nonherders view reindeer as domestic. Herding has persisted in Nome and Teller partly because migrating caribou have remained at some distance from both communities. Nonetheless, two out of three Teller-based herds were lost, while Nome's Davis herd has been reduced to a fraction of its former size.

Based on this chapter, we can now address research questions a. and c., as follows:

a. What are the general patterns of interaction between humans, reindeer and caribou, and how have these developed over time?	a. While herding has been a specialized human-animal relationship specifically between reindeer and relatively small numbers of humans, hunting is a generalized relationship that is enacted between a large variety of humans and animals.
c. What are the general patterns of acquisition, exchange and use of reindeer products?	c. Reindeer can be commodified and monetarily exchanged to a much greater degree than caribou or other wild foods can, but for economic, institutional and cultural reasons, reindeer is prone to defaulting to

	modes of exchange that are nonmonetary or otherwise mirror subsistence patterns.

Although reindeer herding was widespread in the region during the early 20th century, it was only ever a long-term, primary activity among a small minority of the population. This has especially been the case since the 1940s. Herders gradually developed reindeer herding as a set of practices, a body of knowledge and a human-animal relationship in which they were the specialists within the region (question/proposition a). Herding experience has evolved within families as herds have been passed down from generation to generation. Broader members of herding communities have always been involved in reindeer herding activities, but in a more limited capacity. While herders have had varying degrees of success at turning herding into a money-producing activity, broader community engagement in herding activities has involved nonmonetary exchange and community social networks similar to those of subsistence activities (question/proposition b.). At the same time, herders have typically controlled the allocation of their reindeer products, and monetary exchange of reindeer products has been widespread within Seward Peninsula communities (alongside nonmonetary exchange) since at least the mid-20th century. In addition to devastating many reindeer herds, the return of caribou to the region also represented the appearance of an open-access meat source whose products could typically be obtained without monetary exchange or herder permission. This contributed to other challenges herders have faced in attempting to keep their populations separate from caribou.

This chapter has also illustrated that there has been a considerable range of methods and approaches to reindeer herding throughout its history in Alaska. In looking at the present-day Davis and Kakaruk herds in chapter 3, we will see that they are rather different from many of the

historical patterns of herding we have seen. At the same time, dynamism and variation have always been characteristics of Alaskan reindeer herding: in this sense, these herds fit meaningfully within a broader pattern.

Chapter 3: Human relations to living *Rangifer*

3.1 Introduction

This chapter explores current relationships between humans and living *Rangifer* in the Nome-Teller area. One of its main considerations relates to how relationships of hunting and herding are enacted between humans and living animals. Any caribou or domestic reindeer can be hunted. This chapter and the previous one show that hunting—whether authorized or not—has been a reality in some managed reindeer herds. In fact, herders often pursue and harvest their own animals in a way that does not outwardly differ from hunting.

As discussed previously, Alaskan herders differ from their counterparts in much of Eurasia in that they do not migrate or live with their herds. While some have maintained very regular contact with their herds, the intensity of herding effort has varied considerably. At a minimum, herders can manage domestic reindeer by retaining awareness of their animals' movement and generally attempting to keep them within their allotted grazing permit area. In general, herders with whom I have spoken do not view such a loose form of herding as a preferred arrangement,[25] but such a pattern has prevailed at times, whether due to herders' limited resources, disagreement over management or other issues.

Conceptually, such a loose form of herding could be done even with caribou, provided there were no social or legal obstacles to this. Yet in actuality, relationships of herding are more-or-less limited to biological reindeer. Wild caribou frequently join domestic reindeer herds, but their presence makes these herds decidedly more difficult to control (Schneider et al. 2005). If

[25] The situation is different on Saint Lawrence Island and other islands, where a lack of predators, caribou and other reindeer herds reduces the need for intensive management.

herders do not cull these caribou, portions of their herds are more likely to wander off-range, and thus also more likely to lose social/political recognition as domestic reindeer (Beach 1985).

There is much overlap in the specific activities involved in hunting and herding, even where the social relationships with animals and other humans may differ considerably. For instance, either herding or hunting activities on a given day might entail harvesting an animal via firearm in the tundra, field dressing it, and bringing it back home for personal use or giving to family members. Yet these activities are far more readily associated with hunting than with herding. I believe this relates to the fact that hunting is a very general, widespread pattern of relationships between humans and animals in the region, whereas herding is far more specialized and specific. Seward Peninsula residents hunt for a large variety of animals, including reindeer. Socially, hunting is an important part of every community and nearly every cultural group in the region.[26] It is a relationship in which many community members participate, and most importantly, it is critical to the identities of Iñupiaq, Ungalik and Yupik cultures. Herding, on the other hand, is a relationship that humans have with no other species in the region apart from domestic reindeer. Direct participation in herding is limited to only a few communities, and within those communities, only a small number of individuals participate intensively in herding activities. Historically, it is not nearly as deeply-rooted, and it does not enjoy the culturally universal significance that hunting does. Bruce and Ann Davis (2016) referred to it as a "subculture" within broader Iñupiaq culture.

This chapter addresses the following research questions, especially the first two:

a. What are the general patterns of interaction between humans, reindeer and caribou, and how have these developed over time?

[26] The main exception is that many Nome residents do not participate in hunting, and there are enclaves of the community whose members do not have strong connections to hunting or its products.

b. How are reindeer socially constructed as a wild/domestic animal within local communities?

c. What are the general patterns of acquisition, exchange and use of reindeer products?

Despite the central importance of this topic, I have not parsed out this chapter according to hunting relationships versus herding ones. This is because there is currently so much overlap between the two, particularly in Teller, that it makes more sense to discuss human-*Rangifer* interactions as a range of relationships between humans and animals within a particular geographic area. The plan of this chapter begins with the ecological facets of this topic and progresses toward the more social ones. I begin by outlining pertinent non-human-related features of reindeer-caribou systems, and detail the direct, material interaction between humans and different *Rangifer* populations. This section specifically addresses research question a., with its inquiry into the human ecology of *Rangifer* interaction. In section 3.4 (Social representation of live *Rangifer* in Nome and Teller), I attempt to portray the socio-cultural processes that shape human-reindeer-caribou relationships, addressing question b. Although reindeer products are the main focus of chapter 4, services like reindeer tourism and permission to hunt in loosely-managed herds can also be considered products. In this way, this chapter also addresses question c.

3.2 Reindeer, caribou and the Seward Peninsula landscape

This section outlines some pertinent features of *Rangifer* and the nonhuman aspects of its environment. It does not attempt to provide an overview of *Rangifer* ecology in any

comprehensive way (cf. Skoog 1968; Zhigunov 1968), but instead points out some traits that are directly relevant to how reindeer and caribou interact with humans via hunting and herding. Reindeer-caribou interaction depends, first and foremost, on the relative spatial positions of the animals: it is no accident that remaining reindeer herds are located in parts of the Seward Peninsula that have not seen large-scale caribou migration. The cohesion of reindeer herds depends on their remaining relatively localized and isolated within specific regions of the peninsula; WAH, by contrast, ranges over a much larger geographic area. A key concern of this thesis is the extent to which people recognize reindeer as domestic animals that differ from caribou. Toward this end, it is helpful first to outline some of the biological differences between the two varieties of *Rangifer* as they are recognized among local community members and western biologists.

3.2.1 Reindeer and caribou: some pertinent biological traits

When reindeer and caribou occupy the same areas, they have both direct and indirect impacts on each other (Dau 2000, 58-59). The most direct effect is recruitment, in which domestic reindeer join passing caribou migrations. Interbreeding is one potential consequence of this. Colson et al. (2014) have presented genetic evidence showing low levels of reindeer genetic introgression in caribou herds throughout western Alaska, although the herds sampled in their study did not include WAH. Reindeer and caribou also impact each other through competition for shared food sources and transmission of parasites from one subspecies to the other. More indirectly, predators can follow caribou migrations into the vicinity of reindeer herds.

Much of this thesis focuses on the overlap between reindeer and caribou within human social constructs—a subject predicated on their similarity. That said, among both biologists and

Indigenous knowledge-holders there is a consensus that there are biological differences between reindeer and caribou. These differences are both morphological and behavioral. As discussed in chapter 1, they are subtle enough that there is sometimes disagreement over the identification of particular animals.

The terms "reindeer" and "caribou" are generally used to denote varieties of *Rangifer tarandus* that are native to Eurasia and North America, respectively. In Eurasia, there are both wild and domesticable reindeer, although only the latter have been transplanted to North America in any significant number. All North American caribou are non-domesticable. Within Alaska, then, all animals that are of Eurasian origin are domesticable, while all animals indigenous to North America are non-domesticable (Skoog 1968).

Behaviorally, both western biologists and traditional knowledge-bearers agree that reindeer are more docile and sedentary than caribou. This trait, which reflects their domesticability, can be seen in their behavior patterns at a variety of temporal scales. As compared with even relatively feral reindeer, caribou are more skittish and quicker to flee when humans approach them. Caribou typically migrate much longer distances than reindeer do, a fact that is reflected in their longer legs and leaner physiques. Reindeer more frequently move in relatively tight groups, while caribou often spread out across the landscape (Burch 2012; Skoog 1968).

Participants in my Nome and Teller surveys also pointed to morphological differences between reindeer and caribou. Among the most frequently reported were that caribou are larger, with longer legs; have longer and straighter antlers; and often have lighter-colored fur on their lower bodies. Unlike caribou, reindeer are sometimes white or spotted in color. (See 3.4.3 for further discussion of these differences).

3.2.2 Overall *Rangifer* distribution on the Seward Peninsula

On a year-to-year basis, the vast majority of *Rangifer* inhabiting the Seward Peninsula are caribou from the Western Arctic Caribou Herd (WAH), for whom the peninsula has been the primary wintering area since the mid-1990s (although this may be changing). As discussed in chapter 2, WAH population expanded between the 1970s and early 2000s, reaching a high of 490,000 in 2003. However, it has declined since then, and as of 2018 is estimated at 259,000 (Western Arctic Caribou Herd Working Group 2018). Seward Peninsula reindeer population has dwindled from an estimated 9,000 in 2001 (Jernsletten and Klokov 2002, 77) to perhaps 2,000-3,000 today, based on a range of local estimates I have heard for various herd populations. Caribou migrations can fluctuate widely from year to year, and unlike reindeer, large numbers of caribou are present in the region for only about half of each year. Because reindeer are more "phlegmatic" (Burch 2012)—and because herders often control their movements—they naturally tend to be much more geographically localized than caribou, in many cases remaining on specific portions of the peninsula during the entire course of their lifetimes.

In general, animals from WAH migrate onto the peninsula each year during October, spending the winter months in valley of the Kuzitrin River and on the northern coastal plain. In April, the herd begins moving north toward its calving grounds on the North Slope, inland to the east of Cape Lisbourne and Point Lay (Western Arctic Caribou Herd Working Group 2018). They remain in that area till around September when they begin migrating southward through the Brooks Range again. WAH's lengthy migration routes reflects the fact that it is Alaska's largest caribou herd (larger herds migrate longer distances than do smaller ones). During the course of these annual migrations, animals may fan out across much of northwest Alaska.

During the late 1990s and early 2000s, WAH migrated across the eastern peninsula, wintering in the mountains of the upper and middle Kuzitrin River valley (Rattenbury et al. 2009). During these years the herd ranged relatively far south at times, with animals reported as near as within 30 miles of Nome along the Kougarok Road. In more recent years, WAH migration has extended further westward, but has been primarily concentrated on the peninsula's northern coastal plain (figure 3.1). From 2012-2017, WAH animals have extensively used the areas around Shishmaref and have been pushing further southwest toward Cape Prince of Wales. ADF&G biologists noted that between 2016-2018, only about half of WAH migrated onto the Seward Peninsula, while much of the herd remained further north, wintering in the Kobuk River valley (Saito 2018).

During the past five years, WAH animals have occasionally ranged southwest along the American River, coming to within ten miles of Brevig Mission, according to some local reports. These lands are divided from the Kakaruk Range by the estuarial complex of Port Clarence, Grantley Harbor and Imuruk Basin. Further inland, caribou range on the south side of the Kuzitrin River, and a few Teller locals have said that caribou migration has encroached on the Kakaruk range during the past few years. One survey respondent predicted the eventual loss of the Kakaruk herd: "Eventually I think the caribou are gonna take the reindeer anyway, 'cause they're getting closer and closer." Another respondent reported harvesting caribou about 30 miles from Teller, noting that this was closer than usual. However, locals more often described the caribou herd as being much farther inland (60-70 miles from Teller).

In general, the western and southwestern fringes of the Seward Peninsula seem to be the main areas of the peninsula that have not seen large-scale caribou migrations during the past few decades. Of course, this is not coincidental to the fact that this is the area in which the

peninsula's remaining reindeer herds are located; the absence of caribou has allowed them to remain intact. Among Nome and Teller locals with whom I have spoken, there seems to be a general consensus that there are no caribou within the immediate vicinity of either community. Biologists appear to share this consensus, and it is reflected in regulatory closures of corresponding hunting regulatory areas in order to protect the interests of reindeer herders (Dunker 2017).

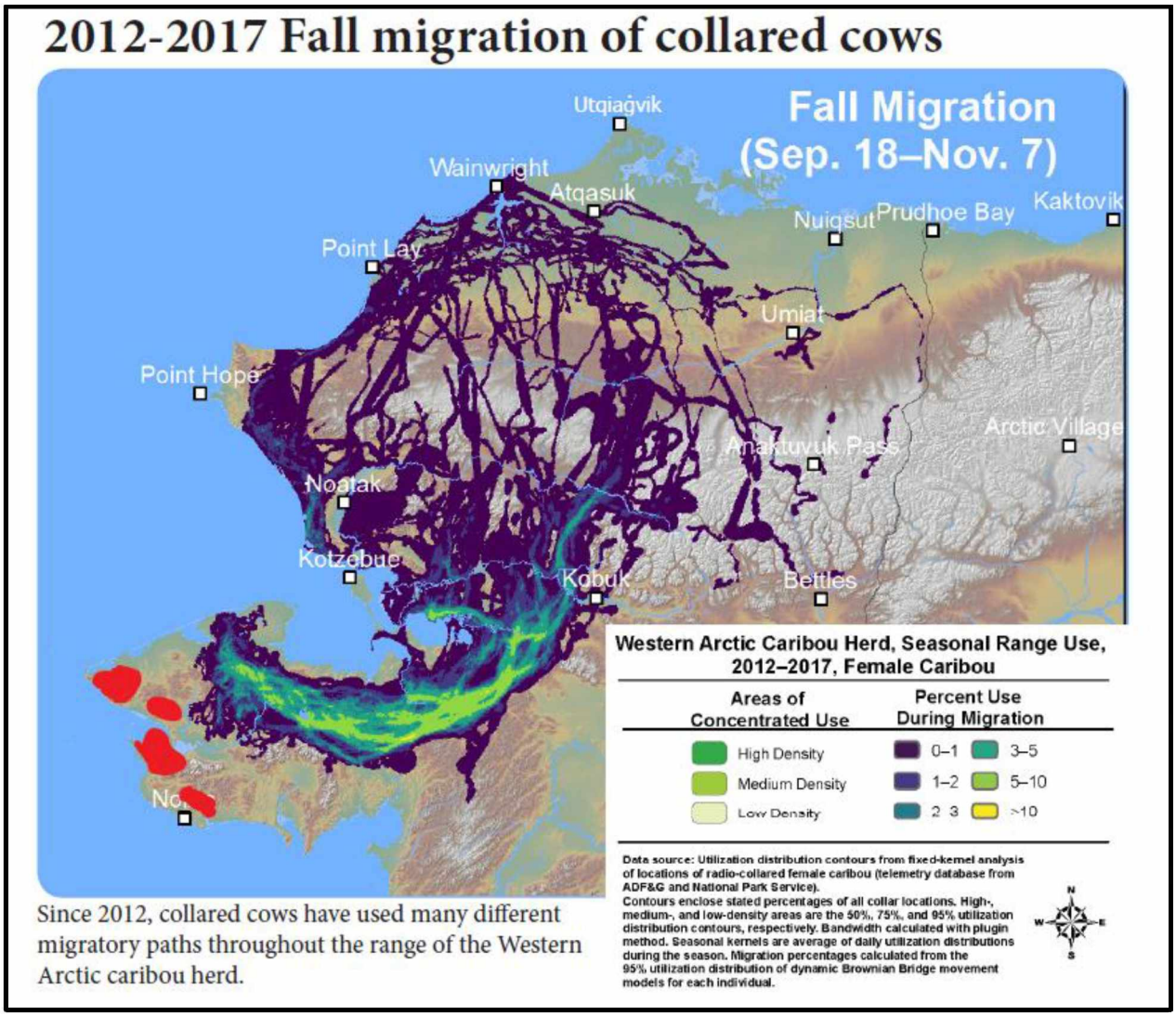

Figure 3.1: Map showing the approximate locations of Rangifer herds on the Seward Peninsula during the 2010s. Reindeer herds are shown in red. Image courtesy of Western Arctic Caribou Herd Working Group (2018), with modifications for this thesis.

There are currently four active reindeer herds on the mainland Seward Peninsula, all of which are located in its western and southwestern area. These include the Ongtowasruk herd (based in Wales), Olanna herd (Brevig Mission), Kakaruk herd (Teller) and Davis herd (Nome). The Ongtowasruk herd, which contained an estimated 800 head of reindeer as of 2014 (Ongtowasruk 2014) grazes on the coastal plain and mountains east of Cape Prince of Wales. The Olanna herd occupies the drainage of the American River. Leonard Olanna (2017) estimates that in a successful corralling he could likely round up 250-300 animals. The Kakaruk herd usually ranges between the Kigluaik Mountains and the coastal forelands between Cape Wooley and Port Clarence. It has not been rounded up in recent years, so its population size is a matter of speculation; most locals with whom I have spoken have estimated 1,000-2,000 head of reindeer. Finally, the Davis herd currently ranges between the headwaters of the Sinuk River and the Solomon area. The Davises report a herd size of approximately 100 reindeer. Other herds in the Bering Straits Region (Nome Census Area) include the Savoonga herd (recently incorporated/organized as White Out Reindeer) and the "tri-party herd" based in Stebbins and St. Michael.[27]

In reality reindeer are dispersed across the landscape far more irregularly than maps of demarcated ranges indicate. Even actively herded reindeer herds often spread out across their ranges, splitting into smaller, transient aggregations. Moreover, even on these actively herded ranges locals sometimes report feralized groups of reindeer that have not had contact with herders in recent years. According to some accounts, remnant animals from herds that have been lost to caribou are scattered throughout the region and/or migrating with the WAH. RHA director Rose Fosdick (2016) states that all 16 permitted reindeer ranges on the peninsula and its

[27] This herd is commonly referred to as the "tri-party herd" because it has three owners: the IRA councils of Stebbins and St. Michael along with private owner Ted Katcheak.

immediate vicinity "[....] prob'ly all have reindeer on them at—like one or two or, you know, reindeer on there—but they're not in herds, they're more like wandering. They'll be found way off their range. They'll be found within a caribou group." During previous field experience in the Northwest Arctic region, I have spoken with hunters who have specifically described harvesting reindeer in places such as the Baldwin Peninsula. Plattet and Lincoln (2014) report that hunters on the Alaska Peninsula, where there has been no reindeer herding since the 1940s, have specific terms for *Rangifer* that are believed to be descended from reindeer or with reindeer-like features.

3.3 Current patterns of human interaction with *Rangifer* herds

This section is an attempt to describe human interaction with reindeer and caribou in terms of its physical and interspecies-social manifestations, as opposed to how it is shaped within the human social domain (which I will discuss in section 3.4, Social representation of live *Rangifer* in Nome and Teller). As we have seen above, WAH cohabits the Seward Peninsula with four managed reindeer herds: the Davis herd, the Kakaruk herd, the Olanna herd and the Ongtowasruk herd. Organization of these remaining herds varies considerably, as does herders' economic abilities to actively manage their reindeer. Equally, some of the herders who currently have the most agency and flexibility in structuring their herding operations have begun seeking to develop approaches to herding that are different than the late-20th century ones we have seen in chapter 2. Herding activities and management strategies may also be quite variable within a given herd, both temporally and spatially: reindeer herding effort may fluctuate from year to year, and herders may interact intensively with portions of their herds while others remain largely outside of their control. Because of this, it is not meaningful to speak of a regional pattern of current reindeer herding activities.

In contrast with herding, hunting represents a more general pattern of human-animal relationship in the region; it is a widespread pattern that is reproduced across different cultures and with different species. Hunting, moreover, is a relationship that can and is reproduced not only with caribou, but also with domestic reindeer in some herds.

3.3.1 Western Arctic Caribou Herd

Hunting is probably the primary relationship through which Seward Peninsula residents intentionally interact with WAH caribou, although nonconsumptive relationships such as recreational viewing also occur in the area. Herd location, hunter location/access, time of year and weather conditions are primary environmental factors that shape caribou hunting, in addition to human-specific factors such as regulations and cultural traditions.

WAH migration is perhaps the most significant ecological factor that determines the timing of caribou hunting: caribou are much more abundant in the region between October and April (Western Arctic Caribou Herd Working Group 2018). Most survey respondents expressed a preference for harvesting caribou during the fall months, often before rutting season. In fact, Roy Ashenfelter (2018) says that he usually hunts for caribou in August: "There's caribou west of here that stay year-round. Not in large numbers but enough to—for us to go out and go get 'em—that wanna try and find 'em. […] I quit hunting 'em in the springtime. Uh, they're too skinny."

Nome residents hunt for WAH caribou considerably more than do Teller residents. In Teller, only three out of the 49 households I surveyed indicated that they hunt for caribou, and one of these participants later implied that the animals he harvested were in fact reindeer. If extrapolated to the community as a whole, we can speculate that roughly three to five households

made the effort to hunt caribou. In fact, a number of survey respondents commented about the lack of caribou hunting in Teller as a whole, and some mentioned that caribou hunting was more common among residents of neighboring Brevig Mission. One respondent remarked, "I know the caribou are far away. You have to go a long distance. I know the Brevig guys go out." Caribou hunting is relatively common in Nome, by contrast. Although I cannot meaningfully estimate a percentage of households that hunt for caribou, a sizeable proportion (8 out of 33) of the respondents I randomly surveyed indicated that members of their household usually hunt for caribou, and six of these described participating in successful caribou hunts during the previous year. Given Nome's large population, Nome residents undoubtedly account for a large proportion of the caribou hunters on the western Seward Peninsula.

In contrast to what my data have indicated, a recent ADF&G Subsistence study of wildlife harvests in Teller indicated that 18.2% of households (i.e. 14 in total) included members that attempted caribou hunting during a 2015-2016 study period (Mikow et al. 2018, 3; 6). Figures show most of the associated harvest occurring relatively near the community, on the coastal forelands between the Bering Sea and Port Clarence and in the western Kigluaik Mountains (Mikow et al. 2018, 11). However, I found a consensus among Teller residents that the Kakaruk herd used this area and that no caribou were present there; this concurs with ADF&G's WAH satellite collar data, as shown in figure 3.1 (Western Arctic Caribou Herd Working Group 2018, 10).

Where Mikow et al. (2018) do not mention reindeer at all in their discussion, an earlier iteration of the same wildlife study (Mikow et al. 2014) briefly discusses reindeer harvest in their study of community wildlife harvest during 2011-2012:

> Hunters in 2 out of 4 study communities also reported limited use and harvest of reindeer during the previous study year. These were likely animals from a local reindeer herd, not feral animals that were mixed in with caribou [...] Five percent of Teller households reported using reindeer, with 2% reporting attempting to and harvesting the resource. [...] The total estimated harvest of this resource in Teller was 1 reindeer, or 0.7 lb per capita (Mikow et al. 2014, 10).

Like Mikow et al. (2018), Mikow et al. (2014) indicate caribou harvest in the area directly south of Port Clarence, where the Kakaruk herd ranges but WAH has not been present. However, Mikow et al. (2014) estimate only seven caribou harvested in this region, compared with the 22 reported in Mikow et al. (2018). The data on Teller reindeer use I present in 4.3.2 (Use and sourcing of reindeer products in Teller) indicate greater levels of reindeer harvest than what either of these reports captures. In all likelihood, both Mikow et al. reports enumerate some—but not all—of the Kakaruk reindeer that Teller residents harvested in this area, with the latter counting a higher proportion of the reindeer harvest than the former.[28]

[28] The problems in these data reflect a general drawback of the methodologies ADF&G Subsistence commonly uses in some of its projects. The nuances of Subsistence Division's survey procedures are quite byzantine, with large numbers of contingencies developed for how to consistently count resource harvests given any number of possible scenarios. Legal/regulatory concerns, rather than local knowledge or priorities, play the major role in shaping this spiderweb of procedures. Many Teller residents view reindeer as similar to caribou and moose, yet ADF&G Subsistence specifically does not enumerate reindeer harvest in its surveys because of their legal status as domestic (as noted in chapter 1). Employees of ADF&G Subsistence typically learn survey procedures and contingencies during the course of many hours of training and field experience in multiple projects. Division staff also spend considerable work time refining the particularities of their methods. However, in smaller-scale, lower-budget studies such as Mikow et al. (2014) and Mikow et al. (2018), local research assistants (LRAs) conduct surveys without staff members present, typically after brief training sessions and little to no on-the-ground practice. Because this is often insufficient for LRAs to become fully familiar with the surveys' more granular contingencies or their legalistic bases, the data they collect sometimes stray from the agency's finer procedural points, and instead reflect local ways of understanding or thinking about subsistence resources. Moreover, LRAs are not paid regular wages, but are paid based on the number of surveys they have

Nome, Brevig and Teller residents typically hunt caribou in the Kuzitrin River valley. For Teller residents, access means a snowmachine or boat trip of approximately 60-70 miles up the Kuzitrin River basin (via Grantley Harbor) or a highway trip via Nome of roughly twice that distance during the snow-free months when the roads are open. Some Teller participants expressed the view that this is a long way to travel, especially given that the Kakaruk herd offered *Rangifer*-hunting opportunities much closer to town. Nome residents with whom I spoke usually said they accessed WAH via the Kougarok Road, a trip of approximately 70 miles. Most said they hunted during autumn (especially October) before snow closes the road to car/truck traffic. An interview respondent described a typical caribou hunting trip from Nome as follows:

> […] On a day-trip that we would take, we would leave early. You know, wake up maybe 5 or 6 AM, depending. […] And we would haul out with a trailer, an ATV.[29] And we would go roughly 70 to 72 miles—even 74 miles—and stop—park there—and you know, get there maybe about eight or nine o'clock, depending on the road conditions—on how long it took us—and then we'd take off on a ATV. Or two, if we had 'em. And we'd go maybe five to ten miles—we don't go too far back there. And we'd just go on the local trail systems until we found caribou that we were able to get close enough to harvest. And take a shot and hopefully it'll drop (Anon. 2017).

Another interview respondent indicated a similar pattern, but said that he does not typically bring a 4-wheeler/ATV. He also described a hunt via boat that resulted in a caribou

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completed. This financially incentivizes quick data collection: an overly meticulous LRA would tend to earn less money than one who were quicker and more approximate with the data.

[29] ATV, an abbreviation for *all-terrain vehicle*, is the same thing as a 4-wheeler. I use the latter term elsewhere in this thesis. Locals use both of these terms, as well as the brand lexicalization Honda, to refer to this same kind of machine.

harvest, although this had originally been intended as a moose hunt (Ahmasuk 2016). In general, Nome residents described being able to hunt relatively close to the road. Many Nome residents have cabins along the Kougarok Road, which also facilitates access to WAH.

Hunter access to WAH is heavily impacted by environmental conditions. As noted above, means of access differ between Nome and Teller residents, and also between summer and winter months. Many participants noted the difficulties posed by changing environmental conditions. The same interview respondent quoted above described a December caribou hunt that was thwarted by uncharacteristically wet snow: "Yeah, it was too wet. We would get our uh, snowmachines and the sleds we were pulling would get stuck, so we'd have to take time to dig 'em out. And the weather turned bad halfway there. And the snow was just miserable to work with" (Anon. 2017).

As noted above, caribou hunting is generally less popular in the winter than in the fall before there is much snow on the ground. In this way, later snowfalls may actually facilitate access to the herd for a longer period during the fall months. Although I encountered much general concern about the impact of climate change on subsistence resources and activities, relatively little of this was specifically directed toward climate-related impacts on land-mammal hunting. (Far more people expressed concern over how the loss of sea-ice was impacting marine-mammal hunting). Many respondents did complain about a large brown bear population, and some mentioned that spring brown bear hunting has been hindered by early breakups and rapidly degrading snow conditions. High predator populations are seen as a threat to human interest in animals such as caribou, reindeer and moose.

The relative effects of climate conditions on hunting and herding highlight some important contrasts between the two modes of human-animal interaction. Reindeer and caribou

inhabit the same kinds of habitats, while herders and hunters use mostly the same infrastructure and technology to access the animals.[30] As a result, weather and environmental conditions could be expected to have similar impacts on a hunter traveling to a caribou herd as on a herder traveling to a reindeer herd. Yet unlike reindeer herding, caribou hunting does not require continuous or repeated contact between humans and particular groups of animals. Hunting caribou only requires favorable enough conditions for a given hunter to shoot (a) suitable animal(s) at some point in the trip, and to transport their harvest back to town. A successful caribou hunter needs enough access to a herd to harvest a sufficient number of caribou during the course of a year, but often this may require only a few days with favorable conditions.[31] Reindeer herding, by contrast, involves a sustained relationship between herders and particular groups of animals. It can become more difficult if contact is too infrequent (and the animals become more feral), and can be disrupted altogether if the herder is unable to access the animals at critical times. Unsuitable weather conditions have prevented some herders from accessing their herds and protecting them from migrating caribou (Rattenbury et al. 2009; Finstad et al. 2006). For this same reason, herders have described camping out with their reindeer during fawning season, when contact is critical but access is difficult (Pushruk 2017; Noyakuk 2017).

In several important ways, human relationships to WAH animals can be characterized as more generalized than are human relationships to domestic reindeer herds in the region. By "generalized," I mean that the same kinds of human-caribou interactions are reproduced independently by many people within communities throughout WAH's migration route. Caribou

[30] A caveat to this statement is that the monetized nature of reindeer herding can sometimes allow herders to make bigger expenditures on accessing their herds than hunters are able to make. As we have seen in chapter 2, herders have a history of using helicopters to round up reindeer at times.
[31] On the other hand, many caribou hunters have regular jobs and cannot adjust their work schedules to the weather.

are a major wild food source in Northwestern Alaska, and caribou hunting represents a common pattern among cultures that have adapted to life in the region. Within Indigenous cultures, there are certainly experts with specialized knowledge of caribou hunting (Nelson 1993); nevertheless, knowledge of how to harvest caribou is quite widespread. Some 40 communities are located in or near the WAH migration route (Western Arctic Caribou Herd Working Group 2016). While there is considerable local variation in the circumstances of caribou harvest (depending on factors such as what time of year the caribou are near a given community, etc.), it is certainly possible to speak about general patterns of human-caribou interaction throughout Northwest Alaska. Moreover, relationships of hunting are ones that hunters in the region reproduce with reindeer, moose, musk ox and other animals. Here, too, it is possible to speak in general terms, despite the varied knowledge required to hunt different species of large land mammal.

3.3.2 Kakaruk herd

During the 2010s, human relationships to the Kakaruk herd have formed a piecemeal hybrid between herding and hunting, with more emphasis on the latter (although even in hunting-type interactions, the practice of harvesting reindeer is colloquially referred to as *butchering*, rather than as hunting). Patterns of human interaction with the herd share much in common with the relationships described of WAH above. Reindeer are left unattended on the tundra for much of the year and are actively herded only on occasion. Behaviorally, these reindeer are relatively feral; Teller residents use hunting methods to pursue, intercept and harvest them.

The range for the Kakaruk herd is bounded in the west by the Bering Sea; in the North by Port Clarence, Imuruk Basin, Grantley Harbor and the Kuzitrin River, and in the South by the Sinuk River. It extends eastward into the Kuzitrin River Valley near Pilgrim Hot Springs. Local

reports I have heard suggest that its reindeer population is somewhat scattered, but mostly concentrated in the western half of the range, including the Kigluaik Mountains and the coastal forelands and foothills between Cape Wooley and Port Clarence. The Nome-Teller highway provides a vehicle route through this area during the snow-free months (typically from May through October), weaving through the mountain range's western edge. People often report seeing reindeer while traveling along the highway, and Teller residents often use it to access the herd via 4-wheeler during the snow-free months. During the wintertime, the snowed-in highway forms the snowmachine route between Nome and Teller. Combined with the animals' sedentary nature (by comparison with WAH), these factors make access to the herd quite easy, especially for Teller locals but also for people from Nome and Brevig Mission. A few Teller survey respondents described harvesting reindeer within 5-10 miles of the village.

In contrast with the completely free-ranging WAH, animals of the Kakaruk herd are subjected to intermittent human efforts to control their movements. Because the herd is quite dispersed, some of its animals have had considerable herding interaction, while others may have had little to none. At least one of the Kakaruk herd's eleven co-owners (see the section below on Ownership and management of reindeer herds, 3.4.2) regularly travels to the herd and sometimes harvests animals or moves them around on the range. Many locals also described a man from elsewhere in Northwest Alaska who bought into the herd in the mid-2010s and hired a helicopter to push some of the animals toward the Kougarok road, near the eastern edge of the range. Some locals have complained that reindeer were injured during this movement. I encountered no Teller residents who had interacted extensively with this co-owner, and I did not attempt to contact him myself. Among people in Teller with whom I discussed the issue, nobody described having first-hand knowledge about his objectives in moving the animals.

Although the Kakaruk herd lacks a functional corral, many of its animals were rounded up in spring, 2015.[32] At that time, owners of the herd partnered with the neighboring Olanna herd in Brevig Mission to use their corral. Jimmy Pushruk explained to me that he had hoped to hold a similar roundup in spring, 2018, but ran out of time before the onset of spring fawning season. The Olanna corral is located on a spit of land across from Teller and the Kakaruk range, so moving the Kakaruk herd into this corral requires pushing the reindeer across the ice of Grantley Harbor. Pushruk explained that the reindeer were initially very resistant to crossing the ice, but that once the first group of animals had begun to cross, the scent-trail they left made subsequent groups less resistant (Pushruk 2017). Community members reported that there were more frequent handlings during the mid-2000s, when the Kakaruk corral along the Tuksuk Channel was still in use. However, by about 2010 it had decayed to the point that it was no longer usable.

Because of both the Kakaruk herd's infrequent corrallings and its open harvest practices, herders have little opportunity to exert control over the herd's population structure. Several survey respondents commented about the lack of castrations, vaccinations, and/or ear-tagging. According to one such individual, who had worked as a herder in the past, "Reindeer need to be tended to. They need to be watched. They need to be fawned. They need more castrations and they need to be moved around a bit more and tamed." Another respondent remarked of the Kakaruk herd, "I doubt there's even one castrated bull there." Rather than being managed through slaughtering and castration of specific individuals (as in reindeer herds that are regularly corralled) population characteristics of the Kakaruk herd are shaped to a greater degree by various hunters who butcher Kakaruk reindeer on the tundra. In this harvest method, it is virtually impossible for the owners to control the particular traits of the individual animals that

[32] See Conger (2015) for an account of this roundup.

others butcher. For instance, while most reindeer herders generally avoid slaughtering fertile cows, some survey respondents with whom I spoke reported harvesting Kakaruk cows on the tundra. (Unfortunately, I did not ask respondents the sex of reindeer they harvested, and I do not have a good sense of whether most Teller residents preferentially shot bulls). In this way, human hunting pressure shapes the population characteristics of the Kakaruk in a way that more closely resembles a liberally-managed caribou herd, rather than the coordinated castration and slaughter that usually characterizes reindeer herding operations.

It is difficult to reliably estimate how many Kakaruk reindeer humans harvest each year. Survey data I have collected (discussed in Chapter 4) provide a rough estimate of how many reindeer were harvested for personal use by Teller residents. However, Nome and Brevig Mission residents also regularly harvest Kakaruk reindeer. Some Teller residents with whom I spoke have suggested that the population of the herd has declined during the past few years. According to one survey respondent, "My comments are, our reindeer's dwindling down. We can barely see herds anymore, like we used to. Back in the day over 10,000. Now we're lucky to see 1,000."

During fieldwork in Teller in March, 2018, I had the opportunity to accompany Jimmy Pushruk on a trip to the tundra to attempt butchering a reindeer. Jimmy had wanted to go to the coastal forelands between Cape Wooley and Port Clarence, but because of wind and poor visibility we instead went inland, following the Teller Highway. Each of us rode a snowmachine; Jimmy pulled a sled behind his and carried a relatively small-caliber rifle (.223). From the bottom of a creek valley roughly 25 miles from Teller, we spotted a group of 30 to 50 reindeer about half a mile from us on a hillside. Jimmy pulled his rifle from his holster and set it in his lap, explaining how we would approach the animals. We did not approach the herd directly but

rode uphill just to the right of a very small ridge separating us from the reindeer. From what I recalled in my field notes, the ridge was not substantial enough to fully hide us from the animals' view. A few hundred yards up the hill it mostly disappeared, leaving a clear slope between us and the reindeer. At that point they were perhaps about 150 yards distant. We angled left about 45 degrees, moving directly toward them. They began showing signs of agitation and walking slowly, straight uphill. As we became closer, they increased to full walking speed and eventually began running from us. We continued uphill in the direction they had gone, reaching a low notch on the ridge a few hundred yards further up. The reindeer were not visible from there, and the weather was becoming worse, so we turned back.

As described in chapter 2, hunting relationships by non-herders are not new in the Kakaruk herd, and nor is it the only domestic reindeer herd in Alaska to include them. During previous experiences in Stebbins and St. Michael I learned that locals very commonly hunt for reindeer in the tri-party herd (cf. Wolfe and Pete 1984). Similarly, reindeer of the St. Paul Island herd are reportedly harvested mainly through hunting. It is not the qualities of human-reindeer interaction in the Kakaruk herd that are unique to it, but rather the social context in which this interaction occurs, as I will explain this further in 3.4 (Social representation of live *Rangifer* in Nome and Teller).

3.3.3 Davis herd

In comparison with most reindeer herding operations in Alaska the Davis herd is quite centralized. The Davises' home is also the base for their herding activities. Bruce Davis, Ann Davis and Bonnie Scheele have incorporated their operation as Midnite Sun Reindeer Ranch (MSRR). Located approximately 12 miles North of Nome on the Davis Range, MSRR sits on a

large parcel of land that includes the Davises' house, their corral and various other outbuildings and structures, including a large building that functions as a multipurpose machine shop/storage/events space.[33]

As discussed in the previous chapter, the Davis herd has undergone intensive changes during the past two decades. The herd underwent a period of relatively infrequent human-reindeer interaction following Larry Davis's death in 2005, and dwindled in size to fewer than 1,000 animals. Bruce and Ann Davis completed a roundup shortly after taking over the herd in 2010, but were unable to complete another roundup till after they had removed the dilapidated corral and built a new one. During significant portions of the past several years, however, interactions between the Davises and their reindeer have been quite intensive.

Figure 3.2: The Davises use haylage and feed pellets as supplemental feed when keeping their animals in captivity. Photo by Odin Miller.

[33] Larry Davis originally had "the shop" constructed as a slaughtering plant, but it was never used for this purpose.

Since 2016, the Davises have kept a portion of their herd (approximately 50 animals) in their corral for extended periods of time in an effort to tame them and establish greater control over them. For example, they kept the herd in captivity consistently during April 2017 and January 2018, releasing them when winter storms caused them to become concerned about the animals' health. They built a moveable fencing enclosure to cover the ends of the corral wings,[34] allowing the reindeer to move freely into the wings during the daytime. This area contained sufficient vegetation for the reindeer to graze in it for a few months. As well, the Davises let their herd graze in the nearby tundra on a controlled basis, typically twice each day. Herders must provide animals in captivity with supplemental feed (Finstad et al. 2006, 17); the Davises have purchased bales of fermented haylage and pellet feed for this purpose, as well as gathering lichen from the tundra nearby (see figure 3.2, above).

The Davis herd also has seen periods with limited contact with herders, particularly the above-mentioned years between 2010 and 2016, when they did not have a functional corral. Shortly after beginning their long-term corralling in 2017, the Davises released about half of the animals due to the size of their corral and the amount of space the animals required for extended captivity. During times when there have been no corralled animals, their herding activities have varied. In the winter months they visit the herd regularly by snowmachine, but during the summer it can be very difficult to move reindeer by 4-wheeler in the mountainous northwestern edge of the range, where they have typically summered in recent years. Often the reindeer are scattered into small groups during the summer months. The Davises had three animals whose

[34] The wings are parallel lines of fencing that form a several-hundred-foot long runway into the corral and are used to funnel the animals into it.

movements they followed using satellite collars (*see* 2.4.3; Finstad et al. 2006, 45) till 2018, when RRP discontinued the program due to lack of funding.

The Davises' approach to herding appears to differ considerably from Simon's (1998) portrayal of early 20th-century Northern Seward Peninsula Iñupiat incorporating reindeer herding into their "hunter-gatherer cultural logic." Instead, the family describes a vision for incorporating agricultural elements into reindeer husbandry. This is reflected in their particular approach to managing reindeer and their ecological interactions. Specifically, they seek to combine intensive human-reindeer contact with a sedentarized lifestyle. Rather than living with the reindeer herd by following its migration, the Davises live with it by keeping it at the corral for extended periods of time. Keeping reindeer in the corral involves providing supplemental feed multiple times a day, as well as letting the animals out periodically to graze in the open pasture. The fact that the Davises live on-site at the corral makes this approach more feasible.

The Davises have often emphasized their goal of "taming down" their herd so that they are easier to control. Most importantly, this process involves extended human contact with reindeer and positive reinforcement of closer human contact. Bruce Davis sometimes describes this process as a cultural transition toward pastoralism or agriculture:

> We want to get away from being a hunting culture to where you have minimal impact and minimal integration with the reindeer, to where we're a pastoral relationship with the reindeer. To where, you're concerned about their daily—and I mean daily, not just monthly—their daily means of, of surviving. […] You have to use uh, Pavlov's Dog. You have to learn […] feed is associated with this action. You know you bring 'em to this part of the range, you feed them. Then they stay there, then maybe you ring a bell—when

you feed them, ring a bell. And they come to you. So, we definitely want to get the animals tame (Davis 2016).

Taming reindeer relates not only to the amount of human-reindeer contact, but also to its quality. As Bruce suggests above when he mentions ringing a bell, the Davises use positive reinforcement to encourage tame behavior. At its most basic level, this positive reinforcement involves moving calmly, keeping an appropriate distance from the animals and avoiding actions that are likely to cause them undue stress.

In many ways Davis's emphasis on domesticity and control seems to evoke the "close herding" of the early private period in early 20th century Alaska (Lantis 1950). Even during the more recent past, herders have sometimes extolled the virtues of village-based close herding facilitated by snowmachines (Henry 2002; cf. Simon 1998, 251-280). Yet greater domesticity and control over the animals have not been universally viewed as desirable. Larry Davis (2001) favorably contrasted Alaskan reindeer herding to the intensive herding he observed in Siberia, noting that Siberian reindeer were so tame that they depended on the herders to find food for them.

In a broader sense, the environment around MSRR has become more "domestic" in recent decades with the appearance of an adjacent housing subdivision and an increase in traffic along the Kougarok Road. The corral is now situated in a landscape where there is visible human infrastructure and human activity. Speaking at the 2016 Reindeer Youth Summit, Bruce mentioned that he had initially felt concerned about whether the nearby housing would cause the reindeer to resist moving into the vicinity of MSRR. He recalled being favorably surprised by how the animals could adapt to human infrastructure (figure 3.3, below). Another reindeer herder

with whom I spoke suggested that the nearby human infrastructure was actually an advantage because of its deterrent effect on predators and other wild animals.

Figure 3.3: Reindeer graze in the wings of the Davis corral with the houses of Banner Creek Subdivision in the background. Photo by Odin Miller.

Due to the herd's small size, the Davises currently harvest very few animals, but occasionally butcher small numbers of reindeer for personal use and/or special events. For example, in summer, 2016, the Davises hired three men from Teller, who attempted to push their reindeer into the corral for the Global Reindeer Youth Summit (GRYS, discussed below). When it became clear that the three would not succeed, the Davises instructed them to harvest a few for the event. More typically, the Davises have harvested animals at the corral (using a knife), as

they did to one reindeer the following year for the 2017 Reindeer Youth Summit, when the herd was in the corral.

In contrast to most herds in the region, human interactions with the Davis herd have also included participation in reindeer tourism and education, which in some cases simply involves performing certain herding activities with tourist presence or participation. So far, tourism activities have mainly involved viewing the reindeer at the corral, although the Davises plan to offer reindeer tours that involve visiting/herding the animals while they are grazing in the tundra. (For further discussion of this, see 3.5.2: Community relations to the Davis herd).

Because the Davises' management strategy has been highly variable and has developed actively over the past several years, it is difficult to speak meaningfully of a regular seasonal round or pattern of activity. Moreover, there may be other *Rangifer* on the Davis range that have seen far less intensive human contact. There have been some local reports of up to several hundred reindeer toward the eastern edge of the Davis range, which have likely not seen human contact since they took over management of the herd in 2010.

My experience with the Davis herd includes four trips to the tundra I took in summer, 2016, in which we unsuccessfully attempted to locate reindeer and then bring them into the corral. These trips helped me to understand the difficulties of locating and maintaining control over a small herd in mountainous terrain during the summer months. Bonnie Scheele led each of these trips; in addition to myself, other participants included her family and friends. The Davises had three animals that were equipped with satellite tracking collars, and use these to ascertain herd location (*see* 3.3.3 on current patterns of human interaction with the Davis herd). However, collar locations were only updated every three days, and so indicated only a general area in which to search. Each of the trips took place in the same general area between the Kougarok

Road and the headwaters of the Sinuk River. We traveled up the road by pickup truck, trailering the 4-wheelers we used to search for the herd in the tundra. On at least one trip, the Davises left the 4-wheelers at a cabin along the road that a friend of theirs owned; on one occasion we stayed overnight at the cabin. While traveling through the tundra, we stopped frequently at vantage points to glass visible terrain. We never sighted any reindeer. On one occasion, a few members of our group smelled the animals. Our final trip was a 20-hour affair in which we traveled to the very headwaters of the Sinuk River. (It was close enough to summer solstice that we were able to continue traveling through the night). On account of the rugged terrain, we eventually left behind our 4-wheelers and walked the last several miles on foot, into a high cirque valley that had obviously seen heavy reindeer grazing over the years. We did not see any animals, although a subsequent satellite reading indicated that they had been within a mile or less of our route, on top of a high bench that we had actually considered checking.

From what I have observed, the Davises have had a much easier time locating and moving the reindeer during the winter/spring months, when they are able to travel by snowmachine. Not only is this much faster than 4-wheeler, but the reindeer generally inhabit the mellow, rolling terrain on the eastern part of their range during this time of year.

3.3.4 Olanna herd

Herders of the Olanna herd are not based in either of the study communities, but the herd is worth describing briefly because it is based in Brevig Mission, directly adjacent to Teller. Significant numbers of Teller residents have had interactions with Olanna reindeer over the years, and the herd has received Kakaruk reindeer on multiple occasions (Olanna 2003; Seetot 2018).

Some WAH caribou have ranged south toward Brevig Mission in recent years. As of 2015, the Olanna herd had only 80 reindeer remaining due to caribou incursions, but received 200 more during the Kakaruk roundup as an informal exchange for use of the corral (Pushruk 2017; Conger 2015). The Olanna herd is periodically monitored and moved by herd owner Leonard Olanna and his brother Michael. It has been corralled consistently during the summer months, although it is not currently large enough to produce meat on any significant scale. Leonard Olanna (2017) told me he is "trying to build up the number without hardly butchering. Just mainly for subsistence maybe."

Leonard Olanna (2017) reports that his reindeer have become more difficult to herd in recent years as he has regularly found scattered caribou mixed in with them. These caribou generally leave the herd before the reindeer are pushed all the way into the corral (Olanna 2017). It is interesting to note that pushing a herd to a specific point such as a corral requires a certain level of control over it. Accordingly, Olanna's comment may suggest that exerting this level of control over the animals' movement tends to separate out those that are not disposed toward domesticity.

Despite its small size, the Olanna herd probably resembles general patterns of past reindeer herding on the Seward Peninsula more closely than do the Kakaruk or Davis herds. Herders leave the herd in the tundra, but attend to it fairly regularly, especially during the winter months. They have generally corralled their animals at least once each year.

Figure 3.4: The Olanna corral. Photo by Odin Miller.

3.3.5 Pet reindeer

I am discussing pet reindeer separately because they are not members of herds in any significant way, and their relationship to humans is distinct from those of either hunting or herding. There are small numbers of pet reindeer scattered throughout Alaska, in addition to agricultural operations with captive reindeer (e.g. Reindeer Farm, located in Palmer;

http://www.reindeerfarm.com). I am not discussing the latter category because it does not occur presently in the Nome area.[35] On the other hand, there are several pet reindeer in Nome.

The Davis family owned a pet reindeer named Brownie for about five years, until she died unexpectedly in 2019. Bruce Davis rescued Brownie after she was abandoned by her mother as a newborn fawn; the Davises kept her in their house and bottle-fed her during the early months of her life. Brownie was fully tame—the Davises report that she showed little interest in socializing or joining with other reindeer when they were nearby. She frequently tried to enter the Davis's house but was invariably turned away (figure 3.5).

Not only was Brownie highly accustomed to human contact, but her living conditions made her dependent on it. The Davises kept Brownie in a horse-trailer but frequently allowed her to move around their property during the daytime when they are out. While Brownie grazed on the tundra around MSRR, much of her diet also came from supplemental feed. When the Davises traveled, they needed to find community members to come to MSRR and feed her.

Other locals involved in the reindeer industry have occasionally described adopting and abandoned reindeer fawns as pets (e.g. Tingook 2017), although these most often do not survive long (the Davises adopted several other fawns prior to Brownie, all of which died after short time periods). A few other Nome residents own pet reindeer. Herders in the region have occasionally kept small numbers of highly-tame reindeer, most notably the sled-deer that were sometimes used during the early decades of Alaskan reindeer herding (Ellanna and Sherrod 2004). (More recently, Johnson Stalker 2001 and Nathan Hadley 2001 describe training and using sled-deer).

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[35] The Davises' recent efforts to keep their reindeer in their corral, as discussed in the previous section, are an example of convergence between open-range herding and captive livestock husbandry. I have heard about a few small-scale instances of reindeer being raised as livestock in captivity on the Seward Peninsula. For instance, in the early 2000s Merlin Henry—who had previously lost his reindeer herd to caribou—worked with RRP-UAF on an experiment in which he kept a small number of reindeer in a holding-pen near his home village of Koyuk.

Like Brownie, these reindeer had names, and Simon (1998, 178-180) states that locals regarded them as dog-like.

Brownie may have had a wider range of human interactions than these other pet reindeer: she was shown to tourists visiting MSRR—particularly when no other reindeer were present at the corral—and for this same reason she was used in educational activities at the 2016 GRYS.

Figure 3.5: Brownie, the Davises' pet reindeer, just after being shooed out of their house.

3.4 Social representation of live *Rangifer* in Nome and Teller

In seeking to understand how human-*Rangifer* relationships are shaped within the human social domain, we can start by describing the formalized social structures, and associated human actors, that ostensibly define and limit human interactions with *Rangifer*. Such social structures include ownership, management and regulation. These topics are far too complex for full consideration here, as they are not the primary concern of this thesis. However, it is impossible

to paint a full picture of human-reindeer-caribou interaction without providing a basic overview of who owns and/or controls interaction with these herds.

Of course, "ownership" is a term that applies only to reindeer, and this constitutes one of the primary social differences between caribou and reindeer. In traditional Iñupiaq cosmology, the former are generally regarded either as being autonomous and independent (Ellanna and Sherrod 2004) while in western society they are seen as belonging to the public (Beach 1985).

3.4.1 Management of the Western Arctic Caribou Herd

In contemporary Alaska, codified statutes, regulations and government bureaucracies play a major role in managing caribou and wildlife populations. On the southwestern Seward Peninsula, regulation, management and enforcement are mainly promulgated by ADF&G's Division of Wildlife Conservation. Federal agencies play a larger role in the northern Seward Peninsula, where there are large areas of National Parks Service land (Koskey 2003).

The State of Alaska establishes caribou hunting regulations through its Board of Game, a panel consisting of seven members appointed by the state governor (ADF&G 2019). ADF&G funds the Western Arctic Caribou Herd (WAH) Working Group, an advisory group consisting of members from various communities and interest groups. State and federal agencies manage the herd in accordance with statutory and regulatory requirements by monitoring it, estimating its population on a year-to-year basis and calculating target harvest levels. Managers base these harvest levels on the principle of maximum sustained yield (MSY) for each caribou herd, as defined by cow fidelity to a particular calving ground (Skoog 1968). For the most part, herd management involves monitoring herd location and health and working to develop year-to-year regulations that meet harvest objectives. Managers can use emergency orders for more

immediate action. The Alaska State Troopers has a cohort of Wildlife Troopers who specialize in enforcing these regulations.

Geographically, government agencies enact regulation and management activities in a modular way: Federal agencies such as the US Fish and Wildlife Service (USFWS) holds management authority over lands designated as federal, while ADF&G holds jurisdiction over non-federal lands (Kancewick and Smith 1990). In the state framework, land-mammal hunting regulations are specific to geographically-defined Game Management Units (GMUs) and their subdivisions. The Nome-Teller area consists of GMUs 22C (Nome area) and 22D (Teller/Kuzitrin valley).

These management/regulatory frameworks play a large role in shaping the interaction between area residents and WAH animals, delimiting a variety of parameters for permissible harvest, including open season, how many animals may be harvested, what kind of equipment may be used, etc. Residents must purchase hunting licenses and track and report their caribou harvests to the state at the end of each year. Government agencies expect hunters to know and abide by the sets of regulations specific to the demarcated areas in which they are hunting. Area residents report that this can sometimes be complex and confusing, and sometimes report that the fear of enforcement has deterred them from hunting when they are uncertain about regulatory particularities (Ahmasuk 2016). ADF&G biologists have said that they actively work to disseminate information to the public (Dunker 2017).

3.4.2 Ownership and management of reindeer herds

In order to graze reindeer on the open tundra, reindeer owners must obtain permits to graze their reindeer on a designated range area. The BLM, NPS and Alaska Department of

Natural Resources (AK-DNR) jointly evaluate and issue grazing permits under the terms of a memorandum of understanding (Bureau of Land Management 2009, 2). Herders must also obtain permits from other landholders on their ranges, such as Alaska Native corporations. Although only four active herds remain on the Seward Peninsula, former herders (or their heirs) who no longer have reindeer have maintained grazing permits for most of the available rangelands in the region.

State and federal landowners establish stocking limits for each designated range area; for example, the Davis range is authorized for up to 2,000 reindeer, and the Kakaruk range for up to 3,000. They also evaluate measures of range health, such as lichen cover (Bureau of Land Management 2009, 15).

Since the herd reprivatizations of the mid-20th century (see chapter 2) reindeer owners have most commonly been individuals, although family members are usually closely involved with herding activities. The Davis and Olanna herds both follow this pattern. Bruce Davis and Leonard Olanna are individual reindeer herd owners who run their herds as family operations. As discussed in chapter 2, the Davis and Olanna herds have both belonged to family members since 1960s and 1970s, respectively.

In the Kakaruk herd, the situation is more complex and requires further explanation. For more than 50 years, the Kakaruk herd mostly followed a similar pattern as an individually-owned family herd. However, since the early 2000s, when Wilfred and Cathy Kakaruk died, the herd's ownership has become much more complicated. Officially, the Kakaruk herd now has eleven different owners, including direct heirs to the Kakaruk family, indirect heirs, owners who have purchased shares, and those who have been granted them. These owners do not coordinate management objectives as a group. Some live elsewhere in the state or even outside Alaska.

Even among the owners residing in Teller, not all have access to the motorized transportation needed to regularly maintain and check on the herd (Pushruk 2017). Each owner is said to have a certain number of animals, but because the herd is rarely corralled and many of the animals are not tagged, the attributed ownership is somewhat abstracted from the actual status of the herd's population.

Among these 11 owners is also Teller-based herder Jimmy Noyakuk (see chapter 2), who merged his remaining reindeer into the Kakaruk herd once his herd had dwindled to fewer than 100 animals. Although he continues to maintain his own grazing permit area, Noyakuk has not attempted to herd reindeer there in recent years due to the presence of caribou (Noyakuk 2017).

As noted above, state and federal agencies give herders broad directives such as maximum numbers of animals allowed on particular ranges, and sometimes more specific ones such as designating certain areas where the animals may not graze. Yet because reindeer herds are understood as private property (rather than a public resource), ensuring sustainable harvest levels is assumed to be their owner's responsibility. For reindeer owners, this means not only limiting their own reindeer harvest, but also ensuring that other people do not harvest their reindeer without approval. Wildlife enforcement officers do not attempt to actively police reindeer harvests. The law protects domestic reindeer as privately-owned property, but only if those animals remain on their owners' allotted ranges (Beach 1985, 11). Additionally, reindeer are supposed to be marked as property with ear-tags, as well as with herd-specific ear-notch patterns that are cut into their ears. Most of the actively-managed Davis reindeer have ear-tags and ear-notches, but Teller locals report that few Kakaruk reindeer do because of the dearth of recent roundups. Reindeer owners can report unauthorized harvest to state authorities, but state officials claim this is often difficult to prove due to lack of physical evidence (Dunker 2017).

Bulletin flyers such as the one shown in figure 3.6 attempt to deter unauthorized reindeer hunting; ADF&G has also published bulletins outlining basic differences between reindeer and caribou.

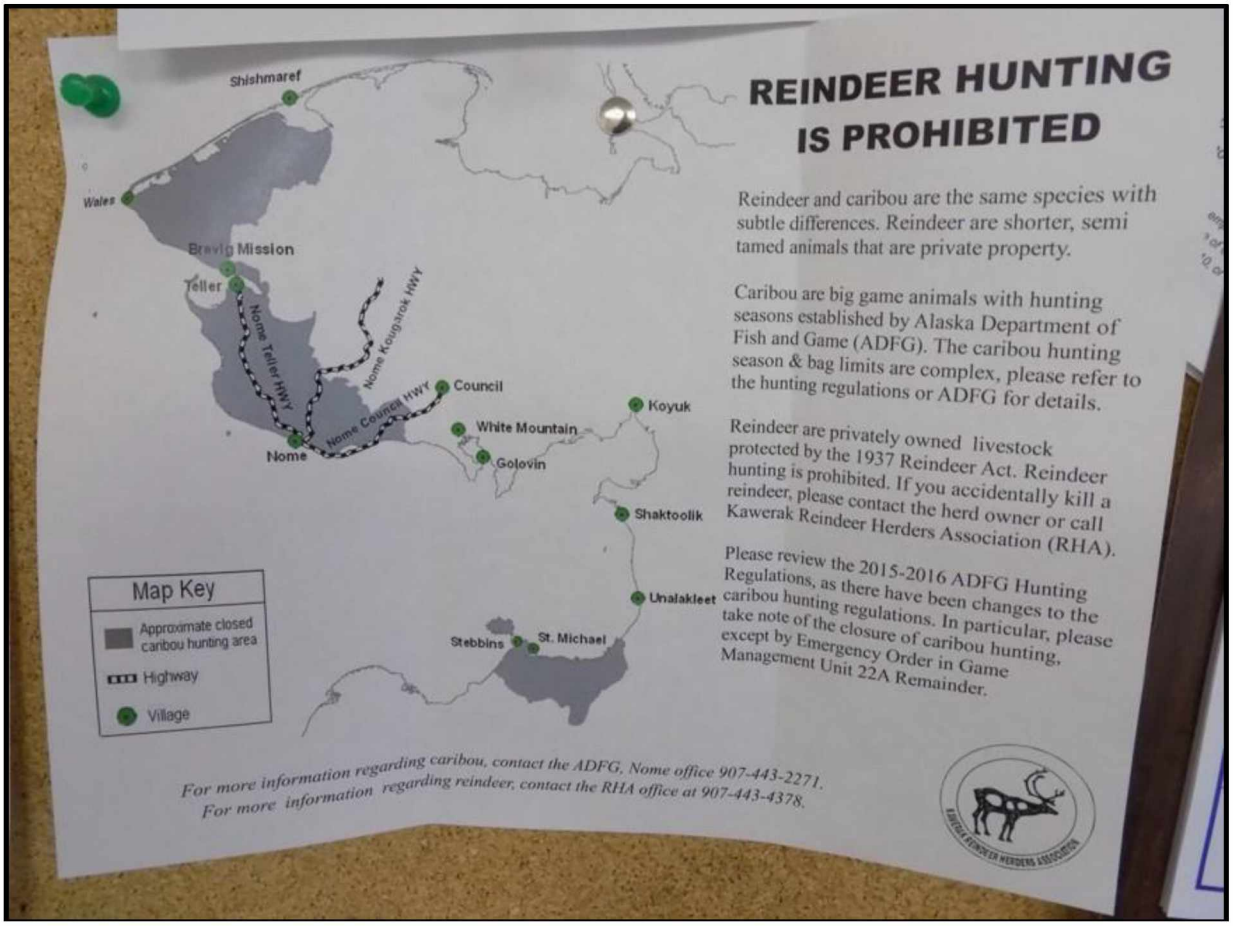

Figure 3.6: An informational flyer posted on a Teller bulletin board warns against hunting on reindeer grazing lands. Photo by Odin Miller.

In communities with reindeer herds, then, the reindeer owners are theoretically the arbiters of human-reindeer interaction. Yet their ability to fulfill this role seems to depend on their perceived degree of authority and control over the animals. In the Kakaruk herd, reindeer hunting has been institutionalized through the practice of "selling tags," an arrangement in which hunters pay reindeer owners for written permits to harvest reindeer. However, the plurality of both ownership and harvesting activities contribute to an overall atmosphere of non-directed

management (cf. Gray 2012) in which harvest often occurs without authorization. While I have heard some reports of Nome residents obtaining permits to harvest Kakaruk reindeer, very few Teller survey respondents reported paying for harvest permits. Moreover, because there is no active management coordination between the owners about harvest levels, individual owners would have little obvious social pressure to conserve animals or to accurately report the numbers they had harvested or sold.

3.4.3 Differentiation of wild caribou and domestic reindeer

Despite the widespread consensus that there are differences between reindeer and caribou, the actual process of how people in the region identify the animals is somewhat messy. The degree of (un)ambiguity between reindeer and caribou depends on a variety of factors including the history of reindeer herding and caribou migrations in the local area, their current status, regulatory factors, and the political interests of parties involved with *Rangifer*. In a basic sense, the fact that the Davis, Kakaruk and Olanna herds have animals that have not been subsumed by WAH indicates that animals on these ranges have remained relatively more differentiated, and thus retained a far more unambiguous status as reindeer, than elsewhere on the Seward Peninsula.

Within Nome and Teller, there is general acceptance that reindeer and caribou are different animals with particular physical and behavioral characteristics that are at least subtly different from one another. I found this to be true among both Alaska Native and nonnative segments of Nome's population, although relative newcomers sometimes showed little awareness of these differences. Many survey respondents reported that they found it difficult or

impossible to differentiate the two varieties of *Rangifer* on this basis, and rely on geographic or human-imposed ways of differentiating reindeer and caribou.

It cannot be assumed that all research participants who expressed awareness of general reindeer-caribou differences necessarily have the practical skill to differentiate the two varieties of *Rangifer* on the tundra. In his discussion of traditional knowledge, Kassam (2009, 77-83) draws a contrast between imparted knowledge ("*knowing that*") and experiential knowledge ("*knowing how*"). Many participants in my survey mentioned *knowing that* reindeer differ from caribou in certain specific ways, while also mentioning that actually telling them apart (*knowing how*) was difficult or impossible for them. The survey question (question C.5) in which I asked respondents about reindeer-caribou differentiation was designed with the intent of prompting respondents for experiential knowledge, asking: *Do you often see reindeer out in the country? If so, how do you tell them apart from caribou?* I did not specifically ask respondents to what extent they felt themselves competent at reindeer-caribou differentiation, so responses are likely to overestimate respondents' self-confidence in this skill.

Compared with Nome residents, people from Teller more frequently reported being able to differentiate reindeer from caribou based on biological traits.[36] When I explained some of my preliminary research results to one woman from Teller, she expressed the view that this was common local knowledge—that surely anyone from Teller would be able to tell reindeer and caribou apart. On the other hand, some respondents expressed that they were generally unfamiliar with caribou because of the lack of caribou near Teller.

[36] Response frequencies reported here should be understood as relative: I analyzed responses to this question by qualitative coding, rather than in a statistical way. In many cases, respondents mentioned more than one feature about *Rangifer* differentiation, and I coded their responses accordingly. For example, if a respondent mentioned fur color, movement patterns and that they were difficult to tell apart, I would have coded their response to all three of these categories.

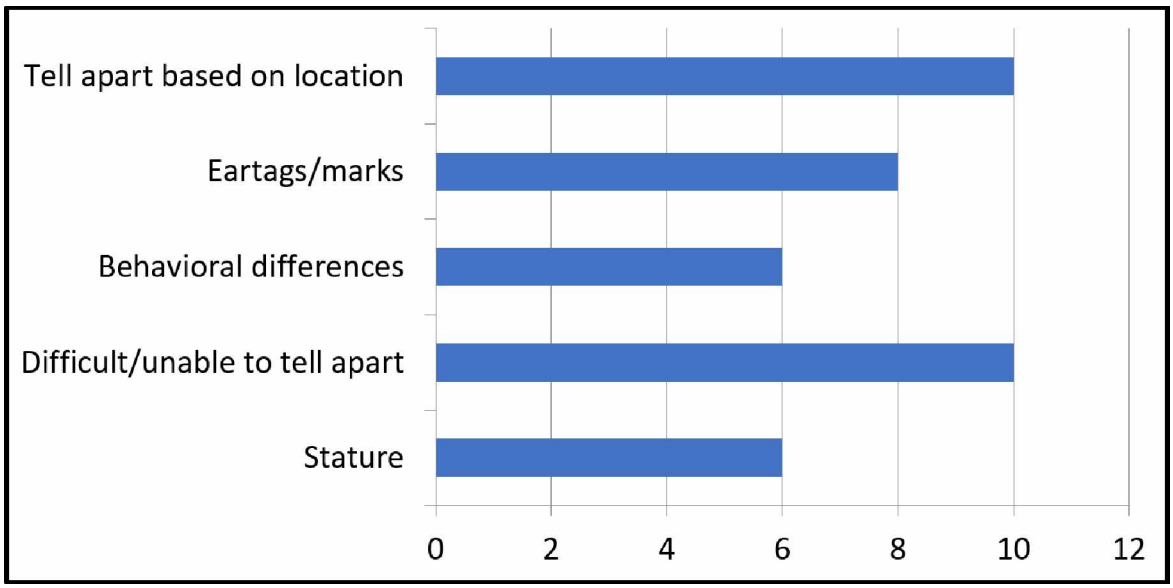

Figure 3.7: Most common ways Nome survey respondents reported differentiating reindeer and caribou. Some respondents gave more than one answer, so response frequency values (shown on the X-axis) are relative.

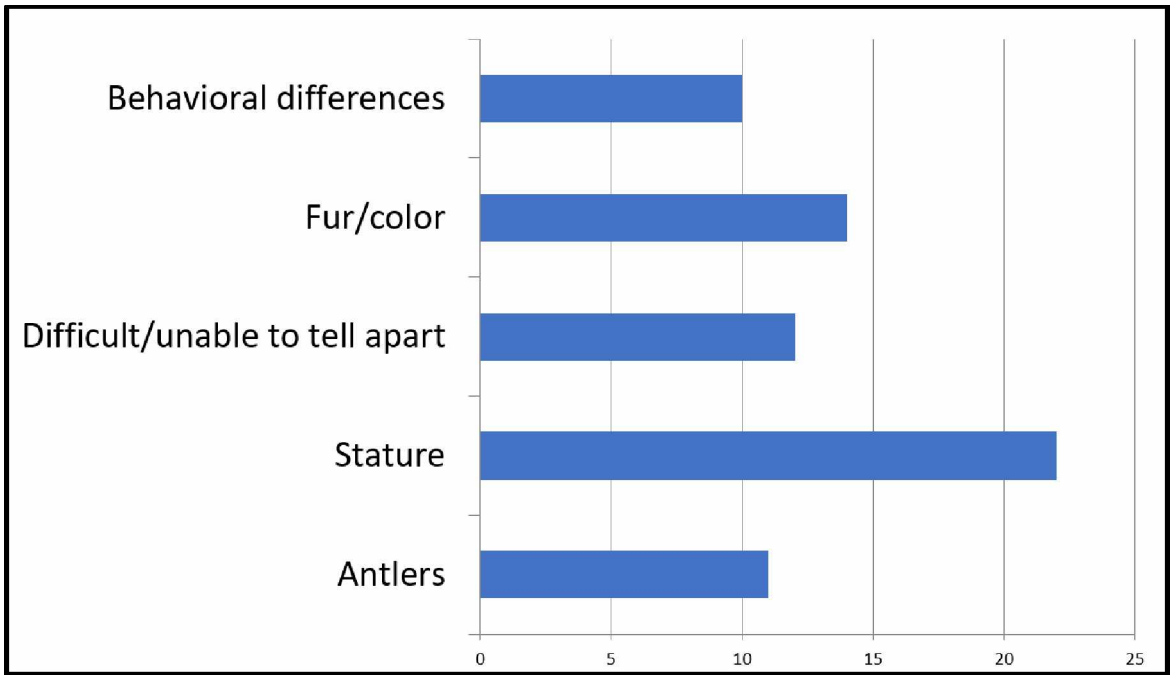

Figure 3.8: Common ways Teller survey respondents reported differentiating reindeer and caribou. Some respondents gave more than one answer, so response frequency values (shown on the X-axis) are relative.

Figures 3.7 and 3.8 show common responses to question C.5 among survey respondents in Nome and Teller, respectively. Most frequently, Teller people mentioned differences in stature (e.g. caribou tend to be taller, with longer legs), fur/color, antler size and shape, and behavioral differences. Nome residents also mentioned stature and behavioral differences relatively

frequently. Nome residents more often mentioned that they found it difficult or impossible to distinguish reindeer and caribou on the basis of biological features. Unlike those from Teller, many Nome respondents were non-hunters, nonnative and/or not originally from the area—and thus, less likely to have traditional knowledge of *Rangifer*. One nonnative Nome resident, a trained biologist, expressed skepticism toward people's claims of being able to visually distinguish reindeer and caribou.

Traditional knowledge of reindeer-caribou differentiation may be more strongly maintained in villages than in hub communities like Nome. As noted above, many Nome residents expressed awareness of reindeer-caribou differences, and a few positively mentioned being able to differentiate them, such as one Iñupiaq survey respondent who had lived in Nome all his life: "Oh, you can tell. Reindeer are a little bit more tame around people. Caribou are spooky." Yet unlike in Teller, I encountered Iñupiaq caribou hunters with multi-generational family histories of *Rangifer* use who said they could not tell the difference between reindeer and caribou in the wild. Another Iñupiaq caribou hunter, a lifelong Nome resident with an extensive family history of interrelationships with reindeer and caribou, recalled a mixed-*Rangifer* encounter in the Davis herd:

> When I was living out of town, here. […] the old man Davis, when he was alive. I went back to go visit. He was butchering reindeer. […] And then he asked me if I wanted a caribou, and I was like "sure, I'll take a caribou." And he said, "there's a doggone caribou in my herd and I wanna get rid of it." So, I was on my snowmachine, he was on his snowmachine. And I followed him around for prob'ly half an hour or so. He kind of drove this way and drove that way and drove this way and drove that way. And then he quickly stopped and he shot the caribou. How he knew that it was a caribou amongst all

those reindeer—some of 'em were umarked—I have no clue. [...] Uh-uh, no I can't tell em apart (Ahmasuk 2016).

It is worth noting that being able to differentiate caribou and reindeer is not critical to hunters' ability to harvest *Rangifer* in the same way that it is critical to herders' ability to maintain domestic control over their reindeer. In the above quote, reindeer herder Larry Davis is able to spot and cull the caribou with little difficulty. Many other Alaskan reindeer herders describe having very precise knowledge of the difference between reindeer and caribou, such as Johnson Stalker (2001) of Buckland: "One guy asked me, 'Johnson, how do you know is reindeer and a caribou?' Well, just like white people and a Eskimo. Same way. You could recognize that one is Eskimo and that one is white. That's the way reindeer and caribou are." It seems likely that such traditional knowledge is generally more highly developed among reindeer herders than among non-herders. Perhaps this is an example of relatively specialized reindeer herding knowledge.

Many Nome residents mentioned non-biological criteria for reindeer-caribou recognition, especially ear-tags and geographic separation[37] (see figure 3.7). A number of respondents exclusively mentioned these as ways of differentiating *Rangifer*. It is hardly surprising that ear-tagging is an often-cited difference, as its purpose involves marking animals as particular owners' property. "If it's got a tag in its ear, he's a reindeer," remarked one Nome survey respondent. Only one single Teller survey respondent mentioned caribou's lack of "marks" as a

[37] Of course, there is no clear boundary between "social" and "biological." Geographic separation should properly be considered both a social and a biological (or ecological, at any rate) occurrence. For my purposes here, however, it is much more useful to emphasize the social aspect of geographic separation, as I have explained earlier in this thesis. Humans relate to reindeer herds as different from caribou herds, in part, because they occupy separate spaces on the landscape. Deliberately maintaining this separation is one facet of a herding relationship.

way of differentiating them from reindeer. This is not unexpected, as very few Kakaruk reindeer have ear-tags or ear-notches, a fact that may also help to explain why Teller residents more frequently mentioned biological ways of distinguishing *Rangifer* varieties. There may also be unmarked reindeer on the Davis range. Even among actively-managed herds in Alaska, it can be very difficult for herders to round up and mark all reindeer on their ranges. In this way, using earmarks as a way of differentiating reindeer from caribou reinforces the efficacy of corralling as a way of socially constructing reindeer as *Rangifer* that are handled domestically.

Among Nome respondents, the single most cited criterion for reindeer-caribou differentiation was the animals' locations. I encountered a general consensus that animals along the first 30 miles of the Kougarok Road are reindeer, as are those along the Nome-Teller Highway, while those in the Kuzitrin Valley are caribou. Teller respondents frequently discussed where caribou and reindeer herds were located, but few stated this specifically as a point of differentiation.

State regulations apply an additional layer of reindeer-caribou differentiation to this area, one that is readily recognized by local hunters. The Davis reindeer herd is located in GMU 22C, which is closed to caribou hunting. ADF&G Wildlife Biologist Bill Dunker (2017) explains that areas with reindeer herds but no known caribou presence are generally closed to caribou hunting in order to protect herders' interest from locals who might (whether intentionally or unintentionally) harvest their reindeer as caribou. Should caribou begin migrating into such a closed area, the biologist can then open it via Emergency Order.

The upper Kuzitrin River basin, corresponding with Game Management Unit 22D, is the primary area in which Nome residents hunt caribou, and seems also to be the most accessible area to caribou hunters from Teller. For the most part, these caribou are concentrated at least 20-

30 miles beyond the Davis range's northern edge. Some locals have reported occasionally seeing caribou near Salmon Lake, which is only about five miles north of the range, although herders have expressed skepticism that these animals are actually caribou.

3.4.4 Reindeer hunting and reindeer-caribou ambiguity

As the last section implied, *Rangifer* identification is not completely unambiguous or undisputed within the Nome-Teller area. Reindeer and caribou are very similar in appearance and behavior, and still live in much closer proximity to one another than they have historically. As we have seen earlier in this chapter, this ambiguity plays out in an asymmetrical way: caribou are seldom ever herded, but (biological) reindeer are frequently hunted.

I have met a few locals who have harvested reindeer without permission, and have referred to these animals as "caribou." In doing so, they leverage the social ambiguity of *Rangifer* as reindeer/caribou toward their interest in positioning it as an open-access resource; as opposed to reindeer herders' interest in positioning it as a privately-held one. One Teller survey respondent, who sharply criticized local reindeer management, described his caribou hunting activities to me. Curious, I asked a few questions about his harvest location, as I had not spoken with many caribou hunters in Teller. He initially regarded my questions with some suspicion, but once he realized I was simply curious, he blurted out "I'm a reindeer hunter," and explained that the "caribou" he had reported harvesting were in fact reindeer. Another respondent ironically described the area around Teller as "caribou country."

Yet Bruce Davis (2016) suggests that even the presence of caribou within the general vicinity seems to create the potential for some locals to relate to reindeer as if they were wild caribou:

> […] The caribou definitely came into the area and decimated many different herds along with my dad's. And he lost a lot of reindeer to the caribou. But also, what happened is that the people here—whoever they are—they've adapted to uh, caribou hunting. And, also with that, they became indiscriminate as to whether they're caribou or reindeer, and they're hunting either-or. And that-that's definitely not helped my situation here. So, the other thing that we're trying to do is to control the reindeer so that, as a shepherd, or as a reindeer herder, that you protect your reindeer from people that would like to shoot them and treat 'em as caribou (Bruce Davis 2016).

The Davises have mentioned that maintaining a presence in the area and being seen managing their reindeer herd has mollified this issue to some extent. The Davises here are relying on a combination of geographic separation, marking (i.e. ear-tags and ear-notches) and their own presence with the animals as herders to socially establish their herd as non-caribou.

Tag-selling was prevalent in the Davis herd for several years during the early 2000s, when it was under different ownership. This meant that reindeer-hunting by Nome residents was a more common practice, and one that there would have been less legal or social incentive to conceal than at present, when the owners categorically prohibit reindeer hunting. Bruce and Ann Davis have suggested that this history of tag selling and widespread reindeer butchering by the public contributed to the unauthorized reindeer harvest that has reportedly occurred on their range since then. As my experience in Teller has shown, it seems that when various hunters are harvesting reindeer on the tundra, it contributes to a perception of the animals as a public or open-access resource. Even if a herder's intent is to limit access to individuals who have purchased tags, there may be complications toward actually enforcing this in practice. While

well-connected locals are often broadly aware of who has been out hunting from season to season (or even from day to day), there may not be as much awareness of who has been authorized to hunt reindeer at a given time. Thus, unauthorized hunting is likely more apparent when all reindeer hunting is prohibited, because locals can safely assume anyone they see hunting reindeer in the tundra to be acting against the wishes of their owners. As noted above, reindeer herders do not have the same ability to legally enforce management of their herds as ADF&G does with WAH. However, the Davises have suggested that establishing a presence in the tundra with the herd helps to deter reindeer hunting.

There may be a variety of different reasons for hunters shooting reindeer under the pretext of caribou hunting. Many hunters in Northwest Alaska have reported intentionally shooting feralized reindeer (within WAH) because they prefer the taste (Beach 1985, 12). One Nome-based caribou hunter described doing this as a young adult in White Mountain during the 1970s and 1980s: "Back then, soon as we—if we saw a reindeer in a caribou herd we went and got those, out of the bunch. They're just better eating" (Ashenfelter 2018). I have heard reports of hunters in the Nome area intentionally shooting managed domestic reindeer for the same reason, although the Davises have indicated that this has been less of an issue in recent years. Conversely, *Rangifer* at the end of the Kougarok Road are generally considered to be caribou that are part of WAH, but some locals have suggested that they are actually feral reindeer, or are mixed reindeer-caribou. However, I did not find a widespread consensus on this topic.

3.5 Communities, local economies and reindeer herds

3.5.1 Community relations to the Kakaruk herd

As we have seen, Teller residents during recent years have related to the Kakaruk herd largely through hunting. Compared with herding, present-day *Rangifer* hunting is a somewhat more decentralized activity, involving small groups without a clear division of labor among group members. Herding implies animals with owners who can assert or delegate control over them, coordinating them toward cooperative activities (Stépanoff 2012). The pluralistic and disputed nature of the Kakaruk herd's ownership has resulted in similarly pluralistic economic relationships to it by residents of Teller and Nome.

Although herding activities are currently somewhat limited, they form a significant part of Teller residents' experiential memories: 50% of survey respondents reported that they had participated in two or more roundups or other herding activities during the 15 years between 2002 and 2017 (when I conducted the survey).[38] Most of these occurred before 2008, by which time the corral had decayed to the point that it was no longer usable. Many Teller residents expressed nostalgia for corrallings. One survey respondent remarked: "I wish it could be like that again. [...] Everybody looked forward to the corralling. Everybody looked forward to helping and sharing. That was one thing I remember."

The fact that the Kakaruk herd lacks a corral and other infrastructure has presented challenges to its management. While few reindeer herds in Alaska have much large-scale infrastructure, most have corrals, and some have other basic infrastructure such as processing

[38] This was in response to question B.1.5, which asked, "During the past 15 years, has anyone in your household [...] Volunteered or participated in multiple herding activities over the course of two or more years?" In administering the survey, I included attending roundups as affirmative responses to this question, even if respondents did not perform specific roles or tasks there.

facilities or on-range cabins. The Kakaruk herd has none of these amenities. Some of its owners do not even have snowmachines or other equipment to access the herd.

On the other hand, there is a considerable amount of public/community infrastructure available to the Kakaruk herd in some form or another. Teller is the only permanently-inhabited community in the Bering Straits region that is connected by road to Nome. This facilitates the acquisition of goods like building materials and 4-wheeler parts, as well as access to Kakaruk reindeer by Nome residents. As well, the presence of the Olanna corral nearby has made roundups a possibility in spite of the Kakaruk corral's non-functionality. In some ways, this is a testament to the past plurality of reindeer herding operations in the area. In most Seward Peninsula communities, using another herder's corral would never have been a possibility, as there would not have been one located anywhere in the vicinity. As noted above, Leonard Olanna received 200 Kakaruk reindeer in exchange for the use of his corral (Conger 2015).

Nevertheless, the current state of affairs gives owners few ways of generating monetary revenue from the herd. For example, velvet antler sales would not be feasible because it requires corralling the herd during the summer months; accessing the Olanna corral requires pushing the reindeer across Grantley Harbor when it is frozen. Where I have heard of Kakaruk owners earning money, it is almost always either through selling tags or butchering reindeer on the tundra and then selling them to meat processors.

As discussed in chapter 1, commodification of *Rangifer* products is ubiquitous to both hunting and herding systems, as per Appadurai's (1986) framework, in which a commodity refers to the phase of a thing in which its exchange value is its pertinent feature. This chapter is concerned primarily with live animals, however; I will consider the topic of *Rangifer* products more fully in chapter 4. Commodification of live animals is a far more particular endeavor than

is commodification of animal products: it presupposes ownership and some level of control over the animals—at least if the individual animal is the "thing" being commodified.

If a herd is the "thing," selling tags could be seen as a way of commodifying a portion of the herd. Yet rather than commodifying individual reindeer based on selective criteria, this process involves exchanging undefined individuals within the herd as a whole. The herder has no control over which animal will eventually be harvested or how this will be done. In other words, selling a harvest permit is to exchange access to a small, indefinite portion of the whole herd, rather than exchanging the products of a specifically selected and demarcated animal.

As noted above, my data suggest that few Teller residents actually purchase reindeer permits. If anything, this seems to be more common among Nome residents who hunt Kakaruk reindeer. Moreover, herd owners often permit their friends and relatives to harvest reindeer for free, or on the basis of informal exchanges. One Teller survey respondent said that he butchered a reindeer for an owner who had no transportation, and in exchange was told he could also butcher one for himself. Teller Native Corporation, which owns lands on the Kakaruk range, stipulates that the herd owners allow the City of Teller to harvest several reindeer annually in exchange for its grazing permit. The city uses these for the community Christmas feast, sending two of its employees to harvest them.

Interestingly, Jimmy Pushruk describes a Nome-based hunting guide's attempt to profit from the Kakaruk herd by taking advantage of its system of selling tags:

> This one man from Nome, what he would do is he would buy a bunch of reindeer permits, I found out. And he had a whole bunch of these big-game hunters in his truck. And they all had these cattle clothes and fancy rifles. Expensive binoculars. And I explained, "Hi, I'm Jimmy. I'm one of the co-owners, and like to see if you guys are

> legal, if you guys have any reindeer permits." And uh he said, "yeah, we do," and he showed me their reindeer permits he bought from another owner. But what he was doing was he was charging these clients, like in a guiding sort of service. And charging 'em beaucoup bucks to hunt his reindeer. And I said, "well, you guys are legal, but do you guys have a—I'm also a Teller Native shareholder—you guys are on Teller Native Corporation land. Do you have a permit to go on this land?" "No." They said no. So um, they all jumped in the car—they asked where the Teller Native Corporation land and I told 'em—and I never seen that guy again. You know, he knew that I knew that what he was doing was, he was making money off the reindeer (Pushruk 2017).

In Pushruk's narrative, the guide is selling human-*Rangifer* interaction as a service. Ironically, this is also what Midnite Sun Reindeer Ranch is attempting to do through its reindeer tours (see below). Yet where the Davises' model depends on their control over the reindeer, this guide's activities took advantage of the decentralized structure of reindeer harvests in the Kakaruk herd (and perhaps also the appeal of reindeer's "wild animal-like" qualities to tourists).

3.5.2 Community relations to the Davis herd

Because it is currently too small to produce significant amounts of meat, or other consumptive reindeer products, the main economic products of the Davis herd are tourism and education. MSRR has hosted Reindeer Youth Summit (RYS) events in 2016 and 2017, large educational camps with participants from Nome and elsewhere in Alaska. The Davises' life circumstances differ from those of many reindeer herders: they began operating MSRR after Bruce's retirement as an oilfield electrician. So far, running a reindeer herd has been an

investment for them—they hope their herd will one day produce meat and other reindeer products.

In many ways, MSRR seems to have more intensive interconnectivity with regional and global economies than does the Kakaruk herd. One key reason for this is because it is part of the community of Nome. While Nome is small and isolated by comparison with Alaska's major population centers, it is a regional hub that is far larger than other, outlying communities. This has clear implications for the economics of reindeer herding. In Nome, goods such as building materials and snowmachine parts are readily available in town; in villages, most such goods are available on a very limited basis, if at all, meaning that reindeer herders (and others) who need them must often order them from out of town. Groceries and gas are considerably cheaper in Nome than elsewhere in the region.[39] Also unlike surrounding villages, Nome is connected by daily jet service directly to Anchorage, making travel there far cheaper and more accessible. This greater accessibility provides an advantage in the Davises' efforts to develop reindeer tourism as part of MSRR, especially because Nome already hosts growing numbers of tourists each year. It may also facilitate selling reindeer products to out-of-town markets, although nonlocal sales are currently a reality for reindeer herds based in the villages of Savoonga and Mekoryuk. On the other hand, none of MSRR's products are tied to global commodity markets in a way comparably intensive to the velvet antler trade (Jernsletten and Klokov 2002).

MSRR has also shown a high degree of social interconnectivity within the region and Alaska more broadly. Like other Alaska Native reindeer herding families, the Davises have a

[39] In fact, when I visited Teller in March, 2018, the community had run out of winter gasoline supplies, which are delivered in a large shipment in the fall before freeze-up makes access by sea inaccessible. The neighboring village of Brevig Mission had stopped selling gas to Teller residents out of fear that its own supplies were running low. As a result, Teller residents could only get gas by snowmachining to Nome to fill fuel drums (a round-trip that uses about 10 gallons of gas) or by getting relatives or friends in Brevig Mission to buy it for them.

good-sized extended family network, including a number of relatives who are interested in and involved with their operation. They exchange services with friends from the community, and are sometimes featured in local media (e.g. Hovey 2017). The peculiarity of MSRR's social interconnectivity, however, stems from its role in *promoting* reindeer herding, particularly through educational initiatives. According to Bruce:

> [...] what we want, is, for the Midnite Sun Reindeer Ranch, is to say, "OK, this is what we've done. [...] We've learned from the different people, and now we're going to put it into practice." And hopefully that-those practices, that do work here, at the ranch, will work at the other places—the other herds that are here within the Seward Peninsula. (Davis 2016)

Since 2013, Bonnie Scheele has been co-leader of the Future Reindeer Herders of Alaska 4-H program, which has included children and youth members from several communities in the Bering Straits region and elsewhere in Alaska. She has said that some of her 4-H activities have been patterned after courses from UAF's High Latitude Range Management (HLRM) program, a certificate program offering reindeer herding-related coursework to primarily Alaska Native students (Finstad 2018). Bruce and Ann have also completed HLRM; Ann now works as an administrator for the program. The Davises have discussed applying its content to their own operation, as well as spreading its ideas through promotion/outreach.

Because of Nome's size and demographics, reindeer herding has probably never played the same role in its social life as it has in Teller or other villages. Yet perhaps MSRR's community is not so much Nome as it is a statewide network of people interested in reindeer herding. The 2016 and 2017 Reindeer Youth Summit (RYS) events drew participants from this

intentional community—the Davises' extended family, HLRM students and instructors, 4-H students, an anthropology student (myself), and government agency workers involved with the Alaska Reindeer Council (ARC). Within this intentional community, perhaps the RYS events have played a social role similar to that of past Kakaruk herd corrallings that were attended by much of Teller's population. Much like RYS, past roundups have been events at which children and youth have learned some of the basic skills of reindeer herding—such as learning how to handle reindeer by wrestling fawns. However, RYS has been much more explicit in its educational goals and content.

The RYS events were funded by grants from the Bureau of Indian Affairs to MSRR, in partnership with Nome Eskimo Community. The 2016 event was part of an Arctic Youth Initiative associated with US chairmanship of the Arctic Council from 2015 to 2017. Originally, Sámi associates in Norway had planned to bring a large youth group for the event (Hence the original name "Global Reindeer Youth Summit"), but ultimately only two Sámi reindeer advocates attended in 2016. In 2017, the event focused more specifically on reindeer culture in Alaska.

In both 2016 and 2017, the event took place over three to four days around the summer solstice in June. Participants camped out in large tents in the grass near the edge of the corral. In 2016, the Davises were unable to corral their reindeer beforehand, but the event still included educational content on reindeer management, making reindeer products, and other topics, as well as a heavy emphasis on food culture. In 2017, the reindeer were at the corral, and the program centered around working with the animals. This included capturing and slaughtering a particular animal; ear-tagging, ear-notching and inoculating the reindeer; and monitoring the herd while it grazed in fields outside the corral.

The Davises have also been working to develop tourism as a product. MSRR has begun selling basic tours to out-of-town visitors, especially during large events such as the Iditarod Sled-Dog Race finish and summer cruise-ship visits to the community. Eventually they plan to offer tour packages that include the opportunity to herd reindeer. In addition to tourism and education, they have stated that their longer-term goal is to provide a mixture of local meat sales, high-end meat sales (such as to restaurants in Anchorage) and craft material or product sales (Scheele 2016).

3.6 Chapter 3 summary

This chapter has addressed research questions a., b. and c., laying the groundwork for their corresponding propositions:

a. What are the general patterns of interaction between humans, reindeer and caribou, and how have these developed over time?	a. While herding has been a specialized human-animal relationship specifically between reindeer and relatively small numbers of humans, hunting is a generalized relationship that is enacted between a large variety of humans and animals.
b. How are reindeer socially constructed as a wild/domestic animal within local communities?	b. Human relations to reindeer as domestic animals depend not only on the extent to which the reindeer are managed or controlled by humans, but also on the extent to which they are defined and recognized as

	domestic (and as different from caribou) within local communities.
c. What are the general patterns of acquisition, exchange and use of reindeer products?	c. Reindeer can be commodified and monetarily exchanged to a much greater degree than caribou or other wild foods can, but for economic, institutional and cultural reasons, reindeer is prone to defaulting to modes of exchange that are nonmonetary or otherwise mirror subsistence patterns.

There are currently four actively managed *Rangifer* herds on the Seward Peninsula, as well as the Western Arctic Caribou Herd (WAH). In the Nome-Teller area, these include the Davis and Kakaruk herds. Both local knowledge and western science have documented subtle and physiological and behavioral differences between reindeer and caribou.

Teller's Kakaruk herd is an example of a herd that is managed in an extremely extensive manner, having existed in a relatively non-domestic state for a number of years. The herd has multiple owners and lacks both coordinated management and herding infrastructure such as a functional corral. As a result, animals are mostly left to roam unmanaged on the tundra and are harvested in a way that closely resembles caribou hunting (question/proposition a.). Their relatively nondomestic attributes also contributes to a certain degree of ambiguity between reindeer from this herd and caribou from the nearby WAH (question/proposition b.). Local residents wishing to harvest reindeer reportedly leverage this ambiguity at times (question/proposition c.).

Nome's Midnite Sun Reindeer Ranch (MSRR) offers a contrasting example of an operation that is attempting to develop reindeer herding in Alaska in a way that is more intensive than many current and previous approaches in the region (question/proposition c.). This includes concerted efforts to make the animals more tame, such as through captivity and supplemental feeding (question/proposition a.). MSRR (also known as the Davis herd) has a stated long-term goal of meat production, but currently has too few animals to produce significant quantities of meat. Instead, it has invested capital into growing its herd, seeking to develop reindeer tourism and education as its near-term products. Educational initiatives, such as the 2016 and 2017 Reindeer Youth Summit events that MSRR hosted, are coordinated toward cultivating interest in reindeer herding in the region, and in reproducing knowledge of reindeer herding.

Chapter 4: Reindeer products and food systems

4.1 Introduction

This chapter draws heavily on the concept of food systems. Dufour et al. (2013, 3) suggest that the term has actually signified two different concepts in anthropological literature. Their primary concern is with food system as "the totality of activities, social institutions, material inputs and outputs, and cultural beliefs within a social group that are involved in the production, distribution, and consumption of food" (Dufour et al. 2013, 3). They connect this definition with a model they have adapted from Jerome et al. (1980), which describes food systems in terms of interactions between nutritional needs, diet, and aspects of the biocultural environment. The second use of food systems Dufour et al. (2013) mention refers to modes of subsistence production such as hunting-gathering, agriculture and pastoralism.

The first definition is most helpful for this chapter, while the second encompasses much of what I have signified with the concept of "human-*Rangifer* systems." However, I should note that neither of the above definitions of food systems is adequate to describe the totality of human-*Rangifer* systems. It is surely true that reindeer herding and caribou hunting have proven culturally resilient throughout the arctic because of their ability to produce the nutrients needed to sustain human life. Many ethnographers such as King (2002, 140) have framed its nutritional role as part of a broader, cultural symbiosis between herders and animals: "Deer rely on people to take care of them, lead them to good pastures, protect them from predators, and pay proper respect to their spirits. People rely on the deer for food, for protection from the winter cold, and to provide meaning in their universe—to be their cultural foundation." In the past, groups of the Bering Straits region relied heavily on reindeer and caribou for their clothing needs (e.g. Krupnik

1993; Burch 2012). Traditional use of *Rangifer* for clothing, velvet antler, crafts, medicinal products and reindeer tourism, contribute to the cultural and economic value of *Rangifer* without directly contributing to its nutritional value.

To the extent that the idea of food-system has conceptual boundaries, then, this chapter veers outside them to a small extent. Perhaps the scope here is best framed as a consideration of inanimate, tangible *Rangifer* products. These are predominantly food products, but also include the nonedible ones made from antler, fur, hide, hoof, bone and organ. Current examples of the latter that I have encountered in my research include Iñupiaq reindeer-fur dolls and shin-bone necklaces adapted from Finnish Saami tradition. Because these products are inanimate, their exchange and distribution differ from exchanges involving permission to hunt, tourism or transfers of animal ownership. The key difference is that inanimate products can be used or exchanged without any immediate need to navigate an inter-special social dynamic, such as by exerting control over an animal's movements or getting close enough to shoot it (see the discussion of "trust" and "domination" in the Theory section 1.4.1). However, this difference should not be regarded as absolute. Traditional Iñupiaq cosmologies—and those of other northern Indigenous peoples—view the human use of animal products as part of the social dynamic between humans and animals. For instance, the belief that waste will cause animal spirits to withhold themselves from offending hunters is ubiquitous among groups that have primarily relied on hunting, fishing and gathering for food production (Knight 2012, 350). Moreover, considerations such as the abundance and availability of game animals influences how they are appropriated and consumed.

Despite the fact that I have included a brief discussion of these nonfood products, the primary concern of this chapter rests with food systems. I believe this reflects the major focus of

reindeer herding in rural Alaska, and it certainly reflects realities surrounding *Rangifer* hunting. One question in my survey asked respondents, "During the period of time you have lived in this region, which do you feel has been the most important role of reindeer herding?" I asked respondents to select one of three possible responses: "Part of region's culture/tradition," "Economic driver/opportunity," or "Food source/food security." Of the 47 Teller residents who answered this question, 79 percent of them (37 respondents) chose "food source/food security," as shown in figure 4.1. The priorities of herders are sometimes different than those of community members without strong ties to herding. Yet as I will discuss below, current herders have also shown strong interest in the role of reindeer as food in the region.

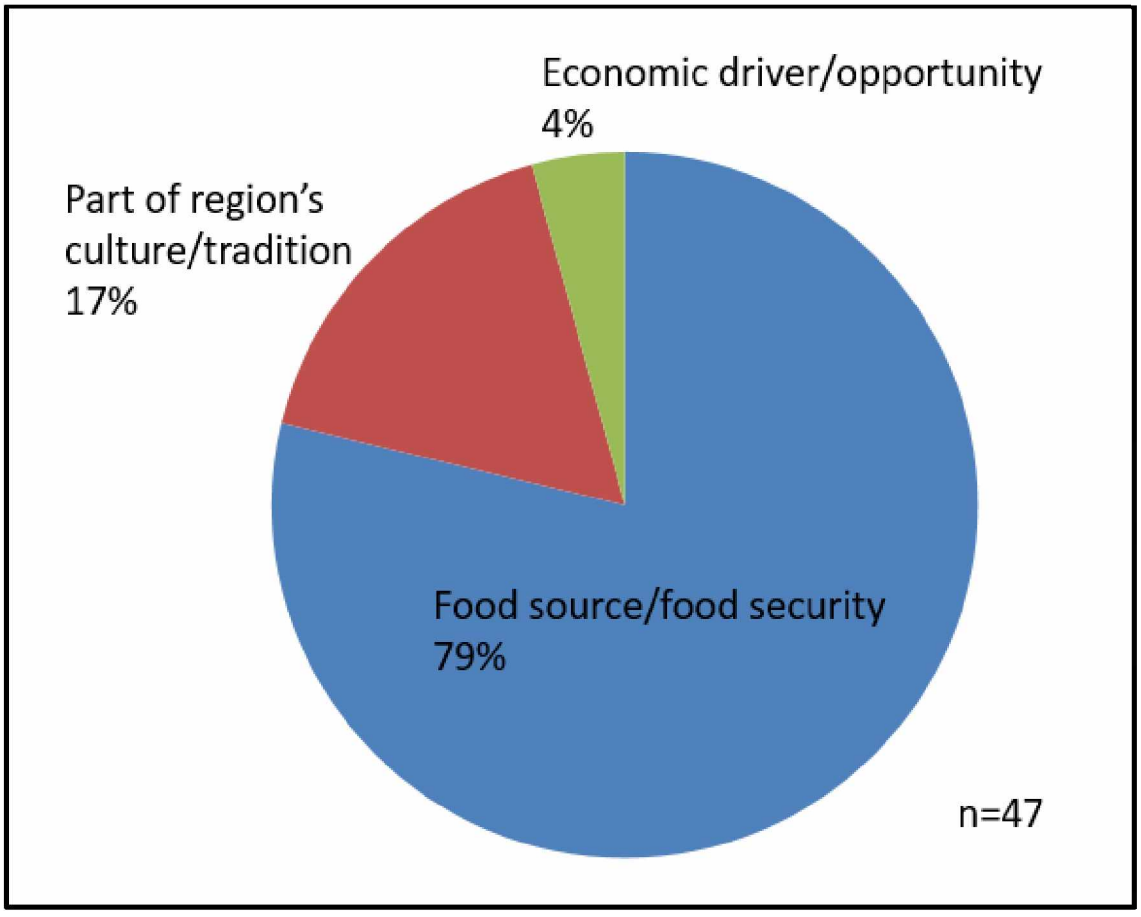

Figure 4.1 Responses to survey question B.5 (Teller): During the period of time you have lived in this region, which do you feel has been the most important role of reindeer herding?

Where chapters 2 and 3 have had considerable thematic parallels to other ethnographic works on Alaskan reindeer herding, the present chapter more closely parallels literature on community subsistence and food systems in the Circumpolar North (*see* 1.3: Literature review). Ethnographies of reindeer herding have often pointed out that its significance is cultural rather than solely nutritional. To this, I would add that the cultural significance of reindeer lies not only in the activity of herding, but also in the processing, preparation and consumption—the significance of which can be obscured in research that focuses too intensively on calories or pounds harvested. The question as to whether reindeer plays a truly unique gastronomic role is a complex one, which this chapter explores through the following research questions:

c. What are the general patterns of acquisition, exchange and use of reindeer products?

d. How does the social role of reindeer as a food source compare to that of caribou and other wild food sources?

e. How have changing relationships to food in rural Alaska influenced the way reindeer herding is conceptualized?

This chapter begins with the broad theme of rural Alaska food systems (4.2) before moving to the specific topic of Nome, Teller and reindeer (4.3).

4.2 Seward Peninsula food systems

Nome's and Teller's food systems can be contextualized within a larger pattern of rural Alaska food systems. These vary between communities and regions, but all include two major sources: 1.) local foods obtained through fishing/hunting/gathering and 2.) foods of nonlocal

origin available for commercial purchase. The remoteness of Northwest Alaska means that store-bought foods are expensive, often poor in quality and sometimes limited in availability. On the other hand, hunting and fishing require expensive inputs of equipment and gas, and often opportunity costs such as missing work. In Northwest Alaska as a whole, marine-mammal hunting has generally formed the most important category of subsistence resource—and the largest dietary contribution (Fall 2016, 55)[40]—although caribou- and land-mammal hunting is particularly important to some areas. Community food in rural Alaska has been undergoing rapid change, both social and ecological. While these food systems have never been static, and have been subject to continuous, large-scale change since European contact, these changes have only intensified in recent years. Climate change has been impacting access to many wild foods, including marine mammals. One consequence of this has been an increase of interest in food-cultivation projects in rural Alaska.

4.2.1 General food patterns in rural and Northwest Alaska

The topic of food in rural Alaska has filled lengthy ethnographic works. Rural Alaska's food systems reflect its geographic and cultural diversity, with foods varying from region to region, community to community, and even among different groups within communities. The cost and availability of store food also varies based on factors such as community size, remoteness and available transportation infrastructure. Still, food systems in Seward Peninsula communities share a number of basic similarities with those throughout rural Alaska, and the Circumpolar North more broadly. As I have pointed out, local food cultivation plays only a small role in rural Alaska food systems; for the most part, food is either wild food or store food.

[40] Categories enumerated in Fall (2016) include salmon, other fish, shellfish, land mammals, marine mammals, birds and eggs, and wild plants.

Of the local foods used in the region, marine mammals, caribou, salmon and other fish are especially important (Ahmasuk et al. 2008). Berries are also very important—their caloric contribution is relatively small, but they are highly valued culturally and contain many important nutrients (Ahmasuk et al. 2008, 254-288; Bersamin et al. 2007).

In the region as a whole, it is possible to speak of a general seasonal round of harvest patterns, although there is significant variation from place to place. These seasonal patterns depend on when particular food sources are present in the vicinity, when access to them is feasible, and when social institutions (local management, regulations) restrict their harvest. When leads begin opening in the sea-ice during late winter and spring (April-June, in years past),[41] hunters from coastal communities begin pursuing walrus, *ugruk* (bearded seal) and other seals. Migratory birds move through the area between April and June. Different edible plants become progressively available as the snow disappears and the tundra begins greening. Among the most popular in the region are *sura* (willow leaves) and *tukkaayuk* (wild parsley; *Ligustum scoticum*). The first salmon runs typically arrive at the mouths of area rivers during late June; the most intensive fishing efforts usually occur during the following weeks (Raymond-Yakoubian and Raymond-Yakoubian 2015). Berry season begins toward the end of July with blueberries and salmonberries (*Rubus chamaemorus*; otherwise known as cloudberries), continuing into September with lowbush cranberries and blackberries (*Empetrum nigrum*; otherwise known as crowberries). ADF&G heavily regulates fall moose-hunting, usually limiting it to a window of a few weeks during August or September (ADF&G 2018, 121-123). Some communities engage in seal-hunting and fishing (for nonsalmon fish) during the fall months. Many hunters obtain

[41] Seasonal sea-ice conditions have changed extremely rapidly during the 2010s. In winter 2018-2019, Norton Sound never froze beyond a few miles offshore, and breakup occurred in mid-late March—a full two months earlier than the average that locals described from past decades.

caribou during October and November, after the arrival of WAH on the peninsula. As winter sets in, many of these food-gathering activities taper off, although activities such as jigging for fish may continue throughout much of the winter. Some hunters pursue caribou during the latter part of the winter, and in some game management units state regulations allow winter moose-hunting. Most hunters with whom I have spoken prefer to hunt for moose and caribou during the falltime, however.

Of the large land animals that inhabit the region, residents rely most heavily on moose, reindeer and caribou. Musk ox hunting opportunities are limited, while few locals are interested in eating brown bear.[42] Caribou has been the single most productive and important of all these land animals, and virtually all Seward Peninsula communities have some residents who hunt for it each year. Yet caribou's nutritional importance has varied greatly among the different communities in the region. Braem et al. (2017, 317, 320) report that caribou formed a whopping 65% of Deering residents' subsistence harvests in 2014, representing 429 lbs. of edible meat per capita. Elsewhere in the region, totals have been considerably lower. ADF&G Subsistence estimates that Shishmaref residents harvested 107 lbs. per capita in 2015 (Braem et al. 2017, 372), Golovin residents harvested 49 lbs. per capita in 2012 (Braem et al. 2017, 48), and Brevig Mission residents harvested 35.2 lbs. per capita in 2016 (Mikow et al. 2018, 6).

Subsistence data from Teller over the past 20 years report 11.5 lbs. per capita harvested in 2000, 0 in 2005 and 0 in 2006 (Alaska Department of Fish and Game 2019). More recent estimates include 9.5 lbs. per capita in 2011-2012 and 15.5 in 2016 (Mikow et al. 2014; Mikow et al. 2018). However, I believe most of the caribou harvest reported in these recent data is actually is not actually caribou, but rather an incomplete count of Teller residents' harvest of

[42] Polar bears occasionally come ashore on the Seward Peninsula—especially near Cape Prince of Wales—but these are generally considered marine mammals.

Kakaruk reindeer, as noted in chapter 3, where I discuss Current patterns of human interaction with *Rangifer* herds (see section 3.3.1 on the Western Arctic Caribou Herd).

In addition to wild foods, virtually all rural Alaskans depend heavily on food from grocery stores. For the most part, these are refined products of industrial agriculture, produced and distributed through globalized supply chains (Naylor 2009). In villages, the most universally available groceries are durable, shelf-stable items such as crackers and canned goods. Village stores also stock frozen items like meat and microwaveable items, as well as refrigerated ones such as sour cream. However, smaller stores often have limited freezer space, and if shipments are delayed (e.g. due to unsuitable weather for flying) these items can easily become depleted. Refrigerated goods and other fresh produce tend to be even more inclement than frozen products—commonly, only a few varieties of fruits and vegetables may be available at any given time. Because many of these are fragile and/or prone to spoilage, items like eggs, tomatoes and lettuce commonly arrive in damaged condition.

A majority of the food available at most village stores, then, is highly processed and generally of poor nutritional quality. Junkfood items like chips and soda pop are quite popular, particularly among younger people, as are highly processed frozen meals and snacks. Elders commonly express concern about this, such as one Teller survey respondent, who commented: "Kids are eating more junkfood, that's one thing for sure. […] I think these kids nowadays are turning to junkfood junkies. Pizza, chips, pop."

UAF Cooperative Extension Service (2016) data consistently show residents of rural hub communities like Nome paying about twice the USDA Cost of Food report values for Alaska, with households in surrounding villages paying even more. This is highly problematic when considering the prevalence of low incomes and poverty in villages. For this reason, rural

Alaskans tend to stock up on groceries in hub communities such as Nome or Anchorage. Many also order deliveries of food from large, Nome- or Anchorage-based grocery stores or other food suppliers.

Despite the poor nutritional quality of village grocery-store foods, they are important in a caloric sense. Even in Northwestern Alaska—the region with the greatest per capita harvests in the state—wild food harvests only fill 36% of the caloric requirements for the population (Fall 2016b:3). Grocery store food also seems to play an important supportive role in Iñupiaq culinary practices. Most traditional food preparations involve some grocery-store ingredients, and many recipes call for specific ingredients.

Both the local/subsistence food system and the foods imported from outside are important parts of rural Alaskan economies. A key difference between them lies in the way their products are distributed and their relationships to money. Wild foods are widely exchanged within communities and beyond, particularly among extended family networks. Subsistence survey studies have shown a common pattern in which 30% of rural Alaska households harvest 70% of the local food—a pattern that Wolfe (2004) has called the 30:70 rule. Many of these exchanges are institutionalized or otherwise encouraged within Iñupiaq and other Alaska Native cultures: for example, I have encountered a widespread expectation that young hunters are expected to give away their first kills of each kind of animal. While store foods are also shared, there seems to be less cultural significance ascribed to this sharing, beyond the general value of reciprocal generosity. Exchanges of store foods are typically more monetized than are exchanges of subsistence foods, as they are generally introduced to local circulation through sales. In some cases store foods are resold within villages—for example, one Teller resident whom I know from my fieldwork sometimes hosts poker games at her house, at which she sells cans of soda pop.

Monetary sales of subsistence foods also occur, but are more controversial. Many Seward Peninsula residents disapprove of selling subsistence foods, and there are state and/or federal laws against most such practices. Nevertheless, such sales certainly occur within the region, and they can allow people who are not well connected with sharing networks to have access to these foods. One Teller family I visited said that during a visit to Shishmaref, they had spent $175 to purchase a roughly two-gallon bucket of seal oil with pieces of blubber, dried black meat and organ in it. More common is to support hunters financially by purchasing needed fuel or other equipment—I have even heard of tribal governments supplying hunters with gasoline for their boats. Direct sales of berries are somewhat less controversial, both culturally and legally, and are regularly advertised on both grocery store bulletin boards and online ones such as Nome Announce.

Anthropologists S. Craig Gerlach and Phil Loring have specifically applied Dufour's et al. (2000) food-systems framework to rural Alaska (Loring 2007; Loring and Gerlach 2009; Gerlach et al. 2011), using it to argue for more holistic consideration of concepts such as subsistence and food security. Gerlach et al. (2011) suggest that current regulatory frameworks and definitions of subsistence hinder rural Alaskans' access to local foods rather than enabling it. For example, garden products are not considered subsistence despite the fact that many rural Alaska communities have histories of gardening (Loring 2007). Similarly, agencies such as the US Department of Agriculture have adopted legalistic assessment standards for food security that do not measure overall wellness.[43] Even when evaluated under such simplistic standards, rural Alaska has alarmingly high rates of food insecurity. Yet evaluating food security in terms of

[43] The USDA defines food security as a household-level concept related to either reported experiences of hunger (moderate-severe food security) or concerns about the adequacy of household food supplies (Bickel et al. 2000).

mere calories does not account for the fact that the foods available in rural Alaska grocery stores tend to be nutritionally very poor. For this reason, Loring and Gerlach (2009, 471) propose viewing food security through an integrated health model that includes a range of individual, socio-cultural and ecological drivers and mediators.

This parallels ethnographic observations that many anthropologists have made. For example, Dunn (2012) describes a village in war-torn South Ossetia in which residents were willing to risk their lives to venture into an active conflict zone in order to obtain culturally-preferred foods. An international NGO had been addressing the food security crisis there by provisioning the village with macaroni noodles. However, being forced to subsist solely off this culinary "nothing" drove some residents into acute depression. Similarly, Yamin-Pasternak et al. (2014) argue that taste plays an important role in the concept of food security itself. During the the Soviet Period, Indigenous Chukotkans were discouraged from eating traditional foods such as fermented marine-mammal products. These traditional food-preparation methods were important adaptations to the scarcity that prevailed after the collapse of the Soviet Union, yet many who grew up during the latter 20th century found themselves unable to tolerate these strong-tasting foods due to lack of childhood exposure to them.

For this reason, a food-systems framework is a more appropriate lens through which to consider rural Alaska nutrition than quantitative measures of food security. After all, reindeer is a small caloric contribution to the region as a whole. Yet discussed in the following section (just below), growing food security concerns seem to be driving recent interest in reindeer herding in different parts of rural Alaska. In this sense, concerns about food security relate to Alaska's heavy dependence on imported food and the vulnerability of its supply chains to disruption (Snyder and Meter 2015).

4.2.2 Changes, challenges and broader trends in rural Alaska food systems

Like other facets of its cultural ecology, rural Alaska's food systems have been changing continuously since before Euro/American presence in the region. Yet these changes have intensified since the mid-20th century. As with the history of reindeer herding (Chapter 2), the monetization of rural Alaska's economies has had major impacts on subsistence practices, as have compulsory schooling and the sedentarization of Alaska Native people into permanent villages (Burch 1975; van Stone 1984). Since the end of the 20th century, climate change and associated environmental changes have had impacts on subsistence food sources and access to them (Kofinas et al. 2010; Gerlach and Loring 2011). Subsistence harvests of fish and wildlife in Alaska's Arctic region have declined by an estimated 37.6% between 1986 and 2012; part of a statewide pattern of change attributed to factors such as road-building, resource development, culture change, vulnerabilities associated with an increasingly cash-dependent subsistence economy, and urbanization (Fall 2016a, 55-6).

In general, rural Alaska communities suffer from a broad range of social problems, including high rates of poverty, alcoholism, domestic violence, suicide, high costs, and lack of basic human infrastructure such as running water. Yupiaq researcher Oscar Kawagley (2006, 91) writes:

> Although the Yupiaq have ancient tenure on this land and although they may be sitting on wanted natural resources, they are invariably shunted aside and receive peripheral tidbits from the wealth derived from their land. [...] The Outside perception of villages as quaint places where people live a romanticized lifestyle persists because we are unwilling to

admit that many of our villages are little more than ghettoes by conventional Western standards.

The legacy of EuroAmerican colonization continues to have direct impacts on Indigenous Alaskans' food security: as Kawagley notes in this passage, they often lack self-determination over the traditional lands and resources from which they produce food. Gerlach and Loring (2011, 125) have pointed out that climate change is not the most immediate issue facing Northern Indigenous peoples, and that "many villagers from across the state have expressed their frustrations with climate change research in general, saying that it has been overemphasized to the exclusion of other socioeconomic, educational, food, and energy issues."

While the above statement still likely holds true in a general sense, it should also be noted that climate change effects have greatly intensified during the 2010s (International Arctic Research Center 2018). In recent years, many rural Alaska communities have partnered with researchers to develop climate adaptation plans. Nome's Tribal Climate Adaptation Plan heavily emphasizes topics such as subsistence activities and food preservation (Kettle et al. 2017). Dietarily, climate change impacts are particularly acute in coastal communities of the Northwest Arctic, with their heavy reliance on ice-dependent marine mammal hunting (Vithanage 2017).

As a whole, Alaska is also vulnerable to disruptions in supplies of food and other goods from Outside because it is at the end of long supply chains and distant from centers of food production (Snyder and Meter 2015). As much as 95% of the food that Alaskans consume is imported from outside the state (Helfferich and Tarnai 2010), although this is not true of most rural Alaska communities. Residents of Northwest Alaska (here, including the Nome Census Area, Northwest Arctic Borough and North Slope Borough) consumed an estimated 438 lbs. of

wild food per person in 2012 (Fall 2016a, 55).[44] However, rural Alaska suffers from greater likelihood of supply disruptions than urban centers such as Anchorage, as Outside supplies must pass through shipping hubs such as the Port of Anchorage *en route* to rural Alaska. More frequently, villages suffer from localized supply disruptions—for example, bad weather preventing planes from arriving with food deliveries. Rural Alaska is also prone to shortages of other goods such as fuel, as well as to very high fuel prices. This can diminish opportunity to obtain local foods, as fuel is needed for boats, snowmachines and 4-wheelers (Brinkman et al. 2014).

One response to both climate change impacts and vulnerable supply chains has been the development of community-level food cultivation projects initiated by local governments, native corporations, individuals and other entities. Small-scale gardening has historically been practiced in many parts of rural Alaska during the 20th century (Loring and Gerlach 2010), including in Nome and elsewhere on the Seward Peninsula. Some communities have even had farms or commercial horticulture projects historically, including Pilgrim Hot Springs north of Nome, the site of small-scale farming during the early 20th century (Hallbert 2013, 9-11). Yet few of these remained by the late 20th century. The 2010s have seen a notable uptick in community food-cultivation projects. Communities, tribes and corporations have recently launched agricultural/horticultural projects in communities such as Iguigig (Gram-Hanssen 2012), Tyonek (Tyonek Tribal Conservation District 2017), Kotzebue (Anderson 2017) and Nome (Bensin 2016). Entities elsewhere in Alaska have been exploring such projects and conducting feasibility

[44] The estimate given is 198.7 kg.

studies. In many parts of Alaska, a warming climate may increase the possibility of growing food. [45]

In addition to agriculture and horticulture, there has also been interest in reindeer throughout rural Alaska recently. A few communities have even taken steps toward acquiring reindeer, although these have been captive rather than open-range. Port Heiden, on the Alaska Peninsula, began the Meshik Reindeer Farm after purchasing several dozen reindeer from the Stebbins-St. Michael tri-party herd (Reedy 2016, 15-16). NPS-imposed restrictions on caribou hunting had partly motivated this project; the region has also maintained strong interest in and memory of reindeer herding from the early 20th century (Plattet and Lincoln 2014). In Interior Alaska, the Stevens Village tribe has begun raising bison on a farm near Delta Junction. It has collaborated with RRP on a rotational grazing model that includes reindeer, making efforts toward acquiring its own. However, projects involving reindeer or other animal husbandry are more logistically complex than those involving crops. Some of this is because of the difficulty and expense of transporting live animals long distances in roadless areas. Moreover, state and especially federal agencies have sometimes shown reluctance or unwillingness to permit reindeer grazing on their lands, even where it has historically taken place (Reedy 2016). This is partially based on concerns about reindeer intermixing with wild caribou populations, although in many cases these caribou populations contain reindeer DNA (Colson et al. 2014; Plattet and Lincoln 2014; Reedy 2016). Gerlach et al. (2011) have suggested that state and federal definitions of "subsistence" as "customary and traditional" uses of fish and wildlife have often reified food-production activities in rural Alaska, engendering government skepticism toward activities that

[45] Based on my travels in different parts of western Alaska, my perception has been that household-level gardening is a relatively uncommon activity, although this may be changing. See section 4.2.5, below (Teller: food systems overview) for further comments on this.

are perceived as "not traditional." This has contributed to notions of Indigenous cultures as static and unchanging, when in reality they have valued flexibility and versatility in areas such as food production. Simon (1998, 4-5) has similarly criticized a ruling by the US Ninth Circuit Court of Appeals predicated on a view of reindeer as not "traditional."

4.2.3 Local concepts: reindeer and "subsistence"

In seeking to understand reindeer's cultural significance within Nome-Teller food systems, it is worth specifically considering how members of these communities articulate this and related concepts. In particular, I focus on the term "subsistence" here (because I specifically asked about it in my survey), and on views of reindeer's place in local gastronomy. While the term "subsistence" is politically highly charged, and the attending controversy was reflected in some of the responses I received, this was informative in conveying the cultural and generational plurality in how rural Alaskans view food issues.

As noted above, scholars such as Gerlach and Loring (2011) and Reedy (2016) have criticized excessively legalistic definitions of subsistence on the basis of their research in rural Alaska communities. Similarly, I have noted that government food studies, such as ADF&G's TP series, tend to parse local food systems according to legal criteria, sometimes ignoring the relational significance of reindeer and other foods not bounded neatly within the state's sphere of concern. These relatively decontextualized approaches contrast with the more holistic and process-oriented ways of understanding food that has been described in anthropological and Indigenous literature (e.g. Merculieff 1994; Huntington and Watson 2012), and which I have encountered in Indigenous communities. However, the local realities of how food systems are conceptualized are complex. Legal definitions and other socio-cultural processes associated with

colonization have had varying degrees of influence on how Indigenous cultures relate to food and to the animals that provide it (e.g. Damman et al. 2008; Raymond-Yakoubian and Angnaboogok 2017). Because it was only introduced after European contact, reindeer has had at least some association with these processes of social-cultural change from herding's inception (Ellanna and Sherrod 2004). As a community-based ethnography, the scope of this study also includes nonnative Nome residents, whose views tend to more frequently align with colonial-institutional frameworks.

My interest in this topic was originally spurred by the complex relationship between reindeer and "subsistence" that I observed in one community (described in chapter 1). Early during my preliminary fieldwork for this project, Bruce Davis told me, "We don't see reindeer as subsistence. We see it as an agricultural enterprise" (Quoted in field notes). This viewpoint reflects the social history of the term "subsistence" in Alaska as denoting food sources that are generally non-monetized and open-access. Other herders with whom I have spoken also emphatically view reindeer as non-subsistence, favoring terms such as "domestic livestock" and "privately owned." Yet in other ways, herders generally seem to support the association of reindeer products with Iñupiaq foodways. For example, Pushruk (2017) spoke of trying to revitalize interest in older culinary traditions among the younger generations. On the other hand, the Davises, as discussed below, have also encouraged culinary innovation within the context of tradition.

Nome residents who use reindeer products are much more likely to pay money for them than are Teller residents. Unsurprisingly, then, Teller participants have seemed reasonably likely to associate reindeer with "subsistence." For example, among responses to survey question D.1, which asked "How would you define 'subsistence?'" were a number of qualitative descriptions

of various local foods and activities, three or four of which specifically mentioned reindeer.[46] In my notes from the surveys, as well as throughout my experience in Teller, it was not infrequent to hear associations between reindeer and subsistence. In response to a survey question about local changes affecting subsistence,[47] one respondent, who had worked extensively with reindeer, lamented the decline of herding:

> Not enough subsistence. […] It is kinda not like how it used to be. […] When everybody got together and helped each other. And everybody would be ready and happy to corral reindeer, corral, and have a big feast over at the corral. […] It's like a dying heritage, a dying culture. […] It was so much different when it was like the 1990s, the 1980s, everybody gathered and got together [...] waiting since spring for the reindeer to come around. [...] Everybody would get excited about corralling.

In response to the same question, another respondent described how fewer locals are involved in "hunting," "butchering" and "gathering." On the other hand, some Teller locals—particularly reindeer owners and their relatives—emphasized that reindeer are privately owned and should not be harvested without owner permission.

Fewer Nome residents connected reindeer with subsistence, although this view was not entirely absent in Nome. One said:

> I think reindeer as a source of meat has saved a lot of communities, a lot of families, from starvation. Having a lot of protein, a lot of food to eat. It's much easier to make reindeer

[46] I should note that previous survey questions focused heavily on reindeer, and survey respondents were aware that it was the main focus of my research, which might have made them more likely to mention it in response to this question.

[47] Question D.6: "What are some of the biggest changes you have seen that have affected subsistence in this area during the past ten or fifteen years?"

> as part of your subsistence food. […] Reindeer has been a steady source of food. And it doesn't need cash.

More typical in Nome were viewpoints that implicitly or explicitly acknowledged its monetization, such as this one: "It would be nice to see more of it occurring to replace more of the crappy American beef on the market. […] We feel like it's really important to have locally-sourced or naturally-sourced food—[that's] why we go for game." As noted above, many Nome residents have expressed broad awareness that it was possible to buy permits to hunt Kakaruk reindeer, and some expressed interest in doing so. These typically did not indicate any awareness of the controversy surrounding the practice.

At a minimum, reindeer was regarded as "local food," and as thus different from grocery store food. Despite rural Alaska's heavy dependence on grocery store food, I have seen no indication that its cultural importance is anywhere near that of wild foods. Unlike many local foods, I have not observed that individual store items are prized in the same way or used as markers of cultural identity. There are certainly a few arguable exceptions to this, such as Sailor Boy Pilot Bread, which is widespread and iconic throughout rural Alaska (Barber 2011).

On "subsistence" more generally, survey respondents expressed a variety of viewpoints, reflecting both localized, culture-specific meanings of the terms and more institutionalized views of it. In discussing subsistence, one Alaska Native respondent from Nome described "the language, the culture, the dancing, singing. Songs are made to honor animals." She emphasized that food production was only part of its significance: "There's also involvement by the community, the storing, putting away, taking care of. [...] There's expectations for [...] I'm not harvesting for myself. I'm harvesting to share." These comments echo themes I have heard about

subsistence foods throughout rural Alaska. Some respondents answered the question "How would you define subsistence?" with specific, qualitative examples of traditions:

> […] *A lot of it is seasonal food. If you hunted caribou, that should be seasonal. If you hunted moose, that should be seasonal. Don't hunt during summer months, don't hunt while they're fawning. 'Cause summer months they taste yucky to me. Fawning time, leave the little babies alone* (paraphrase or loose quote from survey form).

> "I rely on subsistence quite a bit. Like I say I don't kill the land mammals, but the food I get from the ocean is, what I can eat all year round. […] I think it's the best food. Healthiest food, too."

Both Alaska Native and nonnative respondents expressed a variety of viewpoints about the significance of subsistence. Some nonnatives talked about its importance to Alaska Native culture and food security—especially those who had lived in the region for many years and/or who had married into Alaska Native families. Others expressed skepticism toward the very idea of "subsistence." In some cases this skepticism was because they perceived the use of modern methods or technologies as somehow inauthentic; in others it was because they viewed subsistence narrowly, in terms of survival. A few Alaska Native respondents expressed dissatisfaction toward the term itself because of the prevalence of this survival view of subsistence and a corresponding depreciation of its cultural significance. While Alaska Native respondents did not express the same doubt toward the authenticity of modern subsistence practices, some did comment about Nome's heavy reliance on commercial foods. "I don't see Nome as subsistence," one Alaska Native respondent said of his home community. Elsewhere,

when asked about the meaning of subsistence, he contrasted the region's modern hunting, fishing and gathering against the past: "subsistence back in the 1920's, that'd be a totally different answer."

4.2.4 Nome: Food system overview

Nome (pop. 3,691; Alaska Department of Commerce 2017) is one of the largest hub communities in western Alaska, with a relatively diverse population that includes Alaska Native people from throughout the Northwest region, a large number of Euroamericans, and a variety of other cultural/ethnic groups. Demographically and economically, Nome has more in common with other regional hub communities in western Alaska—Bethel, Kotzebue, Utqiaġvik, and to a lesser extent, Unalakleet—than with surrounding villages such as Teller. It has a much more commercialized economy and higher per capita incomes than other communities in the region (Alaska Department of Commerce 2019).

Nome's food systems are unique within the region, again reflecting its status as a hub community. Two large supermarkets offer much of the variety of goods found in the grocery stores of urban Alaska—albeit at much higher prices. Its airport is the point at which commercial food products enter the region from outside, as well as that from which some of them are then passed onward to surrounding villages.

Fall (2016a, 54) presumes that Nome residents use significantly less wild foods than in other communities in the region. (He has inducted this pattern from studies of other western Alaska hub communities such as Bethel, as no systematic efforts have been made to document Nome's subsistence food use). Nevertheless, these foods play an important role in the lives of Nome residents, many of whom are originally from villages. Nome is the major conduit for

exchanges of local foods within the region, just as it is for commercial foods originating Outside. Yet local foods most often move in the opposite direction—from the villages to Nome and then sometimes onward to Anchorage—or laterally from village to village via Nome.

Nome survey respondents often expressed particular fondness for fish and large land mammals, and these were resources that people most commonly reported having used. Many respondents also expressed preference for shellfish, namely the king crabs that can be caught in the Bering Sea by Nome.[48] Most respondents who said members of their households valued and/or used marine mammal products were from Alaska Native or mixed households; very few nonnative households did. One nonnative respondent said, "I only eat those when I'm offered them. […] I don't have the palette for that."

Nome respondents widely hunted land mammals and used their products. Nearly half of the people I surveyed reported that people in their households usually hunt for moose, although far fewer reported that caribou hunting is an ordinary part of their activities. Said one respondent (referring to another household member): "we get enough with moose that he just doesn't go out for caribou." Hunting is a popular activity among both Alaska Native and nonnative hunters, although they approach the activity from different cultural perspectives. To nonnative people from Outside, hunting and wild food culture are often experiences they did not have before arriving. One respondent said, "I quit red meat 17 or 19 years ago. And this past year I've had maybe 6-8 burgers. […] I planned on hunting. So it just made sense to eat it again. […] I don't want to eat the beef. [...] I've had more moose in my life. It's just as good as angus beef if not better."

[48] There are both subsistence and commercial crab fisheries in the area. I prompted respondents to specifically consider crabs obtained noncommercially.

Nome residents also consume some regional commercial fisheries products. Norton Sound Seafood Products, a local processing facility, has a store at which it sells red king crab, halibut, and other locally caught fish.

Nome has two supermarkets—Hanson's (owned by Safeway, Inc.), and AC (owned by Canada-based North West Company). Unlike villages in the region, it has more than ten restaurants and cafés. These include a few restaurants specializing in pizza, a few restaurant-hotel-bars with generic American menu items such as hamburgers, one specializing in sushi and Japanese food, a diner-style breakfast and lunch café, a coffee shop and a fine-dining restaurant that also does catering. Most of these establishments are locally-owned—Subway is the only food-service franchise in the region. One survey respondent, who was born in the early 1980s, suggested that Nome's culinary culture had changed since his childhood, when home-cooked meals were the general standard. Since then, it has become common for people to eat at restaurants very frequently. "When I look at this town and how it runs, it runs on Milano's and Golden Dragon," he said in reference to two local restaurants.

Gardening appears to be a relatively common activity in Nome: 9 of 33 random survey respondents said they had active gardens, and several others described plans to start them. These efforts varied in scale and variety of foods grown. One respondent said he had grown only potatoes during the previous year, while another had a greenhouse in which he grew all the vegetables he needed for four months of the year. Only one respondent mentioned having chickens, which she had used to produce eggs.

In 2016, Unaatuq, LLC launched a small farm project at Pilgrim Hot Springs, 52 miles North of Nome along the Kougorak Road. Unaatuq, LLC is a consortium of native corporations and other organizations that is managed by a division of Bering Straits Native Corporation.

Project manager Rob Bensin (2016) explained that the project has been created with the goal of providing a source of local food for the region as a whole. The farm has a geothermal greenhouse, enabling it to produce a wide array of vegetables for sale a few times each week during the summer and early fall months (Mason 2017). Its products include cabbage, potatoes, tomatoes, turnips, carrots, onions, celery, zucchini, cucumbers, kohlrabi, kale, chard, herbs, and others. Although the farm began production in 2016, it produced only small amounts of vegetables that year. None of my Nome survey respondents reported using any of these products, and most Nome surveys were conducted in spring, 2017—before the 2017 growing season. I conducted Teller surveys in August, after the farm had begun selling some produce. Two Teller respondents said they had used some produce from the farm.

4.2.5 Teller: food system overview

Teller is a relatively small village, with a population that is about 94% Inupiaq. The Alaska Department of Commerce (2019) lists its population as 251.[49] In its demographics and other outward characteristics, Teller shares many similarities with other villages in the region, such as Brevig Mission and Wales. While each of these communities has formed through a particular history in a particular area, their food systems likewise share many outward similarities with those of communities throughout much of rural Alaska. Teller has only one full grocery store, at which food supplies are quite limited. Many of its inhabitants depend on local food obtained from the land and sea, although the availability of and access to these foods is faced with its own unique challenges. Living conditions in Teller are difficult in many ways,

[49] My survey data produce a figure of 221 when my sample is extrapolated based on information about the number of occupied households that I received from the City of Teller. See chapter 1, Analytic procedures (1.5.5) for further discussion of this.

with relatively high rates of poverty (Alaska Department of Commerce 2019) and food insecurity.

Food in Teller comes from several sources, including foods obtained from the land and ocean, those received through exchanges with other communities, the Teller Native Store, and groceries obtained by Teller residents from elsewhere, such as from the grocery stores in Nome. Because the supply of groceries in Teller is quite limited, many residents depend heavily on local wild foods. However, the community has a high rate of poverty—approximately 29% of its inhabitants live below 125% of federally-defined poverty levels (Alaska Department of Commerce 2019)—and not all residents can afford the gas or equipment needed for hunting or fishing. Many of these residents receive local foods through community sharing and distribution networks.

A variety of cultural and economic threads interconnect Teller and Nome, including the two communities' food systems. Their interconnectivity is not symmetrical, however, as Nome is more than ten times larger than Teller. Whereas foods connected with Nome play a large role in Teller's food systems, foods connected with Teller play only a relatively minor or moderate role in those of Nome. Exchanges of groceries travel mainly in one direction—from Nome to Teller. For exchanges of wild foods the picture is more complex. Some Teller residents share products such as reindeer meat with their relatives in Nome, but some also receive foods from Nome relatives that are unavailable or less available in Teller.

Although Teller is on the ocean, much of its population is originally Qawiaraġmiut, from the Kuzitrin River Valley (see 2.2.1: Caribou hunting systems of the 19th century and earlier). These residents have the strongest connections, then, to areas east of Teller along the Kuzitrin River and estuarial system. Till the late 20th century, inhabitants of Teller and other villages in

the region very commonly traveled to different traditional areas for seasonal food harvesting activities (Burch 1975). Even in recent decades, many people have spent extended periods of time at their fish-camps during the summer months. One survey respondent said that her family has continued to spend a significant part of the summer at fish-camp, but that they were one of few that still do this:

> I see that hardly anybody goes out anymore. Like we were practically the only ones camping out, where everyone used to camp. We were practically the only ones camping the whole month of July. People are not going out and doing subsistence as when they did, when we used to follow the seasons.

Fishing, especially for salmon, is one of the most popular and important food prodution activities. In many ways it is accessible to a larger section of the public than are activities such as large-animal hunting. Residents can set salmon right in town on the shores of Grantley Harbor, and do not require boats to do so, as they can employ the tide to deploy and check their nets.

Sea mammal products are widely used in Teller, and are preferred foods. One interview participant outlined a general pattern of seal-hunting activities:

> [...] mostly springtime—we hunt seals. And then, falltime we hunt seals also. [...] It's almost time—like it's August right now. Some of the guys will start hunting now in some places, just for a few seals anyway—at least the skins, like spotted seals. But later on, like next month—September, when it really cools down, then we'll start hunting them bigger ones: bearded seals. And they're the favorite (Tingook 2017).

Some locals in the region have mentioned that marine-mammal hunting is generally a more prominent activity in neighboring Brevig Mission, whose inhabitants are Sinġaamiut, who have traditionally depended heavily on ocean hunting.

Locally, Teller residents mainly purchase groceries at the Teller Native Store, which is owned by the Teller Native Corporation. During visit to Teller in March, 2018, I spent considerable time at the grocery store. While I had traveled to many villages, and was used to high prices, in Teller I was surprised by the large number of basic items that were missing. When I later spoke with the store's manager, he explained that it had been experiencing supply problems due to inclement weather that winter: "We prob'ly have 15 invoices that need to be filled yet. […] But it's just the time of the year where it's just bad weather all the time. […] We got prob'ly a lot of stuff piled up in Nome. […] I hope we start getting stuff" (Quoted in field notes). Even during the summer months, when the highway is open, the store relies on air deliveries for all of its supplies. The manager said that the store does not have a vehicle with which to transport shipments from Nome to Teller, although he said they were considering purchasing one. Locals have often expressed frustration about these supply problems. "They have a whole wall of pop but no milk. A whole aisle of pop and chips and no milk," a friend complained about the situation in winter, 2019. Like most village grocery stores, the Teller Native Store also stocks nonfood necessities such as kitchen supplies, outdoor clothing and ammunition.

The only other source for commercial foods in the village is a very small store that Lulu Menadelook and Jimmy Pushruk run from their home. They mainly sell convenience items such as chips, soda pop and energy drinks, but are open much later in the evening than is the Teller Native Store. Otherwise, Teller locals also purchase foods by ordering from stores outside the

community, such as Wal-Mart and Span Alaska in Anchorage. Some also order from Full Circle Farm, a Washington-based farm offering customer delivery. Ordering food by mail can incur very expensive shipping costs. Many Teller residents stock up on provisions during visits to Nome. Teller local Pam Ablowaluk (who moved to Nome in 2018) suggested that commercial foods from Nome are a needed supplement to those available at the Teller store:

> We always get from Nome what they don't have here. Like, lettuce and fruit and meat. That store's so dumb, they only, like—like right now they only have hamburger and chicken. Last week all they had was chicken nuggets. A lot of these houses will eat the same thing, like when it gets here. […] Like when a order of pizza comes in everyone'll get pizza (Quoted in field notes, used with permission).

Some Teller locals with boats and/or snowmachines shop in neighboring Brevig Mission. I visited the Brevig Mission store during March, 2018—at that time it seemed quite well-stocked compared with the one in Teller.

In contrast to Nome, very few Teller locals said they had grown any of their own vegetables, and those that did mostly described their efforts as very small-scale—such as growing potatoes in a plastic tote, in the case of one woman. A few others said they had previously had larger gardens, or had plans to start them. Yet engagement with the activity was much lower than what I observed in Nome.[50] Two respondents mentioned they had obtained produce from the Pilgrim Hot Springs farm.

[50] As noted above, I have similarly seen little gardening in other western Alaska villages I have visited. To some extent, this undoubtedly reflects the fact that gardening has a much shorter history—and clearly much less cultural significance—compared with hunting, fishing and gathering. In this way, gardening has some obvious parallels with reindeer herding, as a food production activity that involves some form of domestication, and which was introduced to the region at a similar time in history. However, there are also many potential differences because of the different nature of the two activities, as well as the kinds of

Grant-funded community wellness initiatives have included a focus on traditional food, such as weeklong summer youth camps that Tanya Ablowaluk, Tribal Administrator for NVMI, has helped to organize:

> […] We meet at the beginning of summer and the kids vote on, or—there's certain times of the summer we do certain things. And if it's berry-picking or fishing season or greens, you know, they vote and whatever-whatever subsistence we're gathering that time of the year. Then we'll go—like if they—if they choose to do egg-hunting and picking greens we'll go in June—if they want to go fishing and pick berries we'll do it in July—if they choose to, maybe moose-hunt, um, then we do it in August or September (Ablowaluk 2018).

The camps are intended to "[…] give [the youth] different options and let them know that there's people out there that care and we don't want them to get into trouble." Some of the youth that attend these camps are from households that do not actively engage in such activities. "About 50 percent of the youth we bring are learning—doing it for the first time," Ablowaluk says. Elders from the community also attend these camps to guide the youth. At the time of my first visit in August, 2017, Ablowaluk had just returned from facilitating one of these camps, at Tuksuk Channel, at which the youth had just caught a young *ugruk* (bearded seal).

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food and wealth they produce. I did not discuss attitudes and perceptions of gardening with locals to any great extent, so my understanding of local attitudes toward gardening is limited. I hypothesize that general cultural orientation toward wild food production—and the question of wildness versus domestication in human-plant-animal relationships—likely has some bearing on gardening interest among the Bering Straits Inupiat. My committee member, Dr. Sveta Yamin-Pasternak, has suggested that perhaps gardening is a developing "subculture" within rural Alaska. This would be a fascinating avenue for further research, especially in light of the recent interest in food cultivation projects in rural Alaska.

4.3 Reindeer distribution and exchange in local economies

4.3.1 Use and sourcing of reindeer products in Nome

Historically, reindeer has been quite significant as a community food source, and long-term Nome residents generally remember it as such. However, the availability of reindeer meat in contemporary Nome is very limited as compared with past decades. This, of course, reflects the decline of reindeer herding since the 1990s, both in Nome specifically and in the region as a whole. The Davis herd is currently not large enough to slaughter animals for sales to retailers or even to individual residents. Random survey respondents reported using meat from various other herds in the region, but none said they had used meat from the Davis herd. Because I did not achieve a large enough sample for the Nome survey, I cannot provide a reliable estimate of community reindeer meat consumption. Even these limited survey data, combined with my ethnographic experience in the community, can help in providing qualitative understanding reindeer use patterns in Nome.

Out of 33 random survey respondents, ten reported using reindeer meat during the previous year, as shown in table 4.1. The diverse sourcing of this meat reflects Nome's role as a food hub. Respondents reported using meat from Teller's Kakaruk herd (3 respondents), the Savoonga herd (2), Brevig's Olanna herd (2), Wales' Ongtowasruk herd (1), Shishmaref[51] (1) the Nome AC grocery store (3), and Mr. Prime Beef (1), a meat retailer in Anchorage.[52] Five of the nine respondents reported using less than 10 lbs. of reindeer meat, while five reported using more than 20 lbs. Of the five that reported using more than 20 lbs., three said the meat had come

[51] There is not currently a reindeer herd near Shishmaref, but locals commonly describe some *Rangifer* on the northern Seward Peninsula as having reindeer-like features. This has been a subject of disagreement, however. It is also possible that the meat this respondent received had originally come from a reindeer herd elsewhere.

[52] Another respondent said he had traded for reindeer meat from a friend who had shot a reindeer, but he later admitted he did not know where it was from or whether it was a reindeer or caribou.

from the Kakaruk herd (one of whom also used meat purchased from AC), while two reported that it had come from the Savoonga herd. The greatest use reported was 750 lbs. of reindeer meat by one respondent whose household both purchased and received it from the Savoonga herd, but of this total, 200-250 lbs. were given to relatives.

Table 4.1: Use of reindeer meat by Nome survey respondents who reported using it.

Amount (lbs.)	**How acquired**	**Place of origin**
4	bought	Nome AC
4	bought, received	Brevig Mission, Nome AC
7.5	received	Brevig Mission, Wales
7.5	received	Shishmaref*
21	bought	Savoonga
30	bought, received	Teller, Nome AC
45	received	Teller
136	harvested	Teller
750	bought, received	Savoonga

Most likely, Nome residents used more Savoonga reindeer meat the following year, after the herd there incorporated as White Out Reindeer and began filling out-of-town orders. Herder Richmond Toolie reports that White Out Reindeer slaughtered animals in March, 2018 for this purpose, and estimated that Nome residents ordered at least 12 of these animals. White Out Reindeer has sold reindeer meat in quarters for between $5-8 per pound; the buyer must also pay shipping costs. As per usual, White Out Reindeer slaughters during the winter months, but as of late February, 2019, it had not yet been able to slaughter or fill any orders for winter 2018-19 due to persistent bad weather (Richmond Toolie, pers. comm, 22 February 2019).

None of the random survey respondents had acquired any meat from the Davis herd—unsurprising as the herd has been too small to sustainably slaughter many animals. However, a few other Nome residents with whom I spoke reported receiving Davis reindeer meat, mainly residents who had helped with herding or other tasks at MSRR. In addition to the five herds

already mentioned, the Bering Straits region also includes the Stebbins-St. Michael tri-party herd. Although no random survey respondents reported receiving meat from the tri-party herd, I encountered one other Nome resident who described receiving a significant amount of meat from it. It seems clear to me that meat from every meat-producing herd in the Bering Straits region ends up in some Nome residents' freezers each year. This reflects both the regional nature of sharing and distribution networks in Northwest Alaska (Wolfe 2004) and Nome's role as a food hub.

Nome's AC grocery store regularly sells reindeer meat for $12.99 per pound. Reindeer sold at AC originates on Nunivak Island in the Yukon-Kuskokwim Delta region of southwestern Alaska, and is available at AC stores in at least 11 other communities in western Alaska. Nunivak reindeer are slaughtered for shipment between late fall and early spring and are field-dressed on-site. The carcasses are then shipped to a processing facility in Anchorage operated by Northstar Meats (an AC subsidiary), where they are cut, vacuum sealed and packed into 12-pound boxes containing packages of steaks, 8-pound boxes of roast packages, and 32-35-pound boxes of stew-meat packages.

A worker at the Anchorage facility told me that AC tries to order 30,000 lbs. of reindeer meat each year from Nunivak Island, but said they are not always able to get that amount. Given an average carcass weight of 136 lbs,[53] this amounts to approximately 220 reindeer carcasses per year.

A balance sheet I obtained listed sales of reindeer meat at various AC locations around Alaska during certain periods of 2017 and 2018.[54] Although these data only cover January-

[53] This is a conversion factor that the Community Subsistence Information System website (Alaska Department of Fish & Game 2019) gives for "feral reindeer" in the Northwest Arctic Region.
[54] In addition to Nome, these included Barrow (Utqiaġvik), Bethel, Dillingham, Kotzebue, Unalakleet, St. Michael, Mountain Village, Emmonak, Hooper Bay, Kiana, St. Marys. If these data indicate the total

March, 2018, they indicate that the Nome AC sold $7458 worth of reindeer meat during this period. Assuming all this meat was sold for $12.99 per pound, this indicates that the Nome AC sold about 575 lbs. of reindeer meat during these three months. (An employee confirmed to me that the prices listed were retail prices). If this amount is assumed to have remained consistent throughout the year, it would indicate that the Nome AC sold about 2,300 lbs. of reindeer meat during 2018. Some of this may have been subsequently purchased by stores from other communities, however. I saw that the store at Brevig Mission was selling this exact same reindeer meat (i.e. labeled with the address of the same Anchorage packing facility) for $14.49 per pound. I did not learn where the Brevig store acquired the meat, nor do I have a sense of how widely it can be found at other non-AC stores in the region.

Reindeer meat is sometimes available at Norton Sound Seafood Products, a store operated by Norton Sound Economic Development Corporation (NSEDC) in conjunction with its seafood processing plant in Nome. Sales and Project Analyst Justin Noffsker states that he purchases five carcasses each winter, usually from Wales or Stebbins-St. Michael. This equates to a total of about 650-700 lbs. of meat. The store cuts all the reindeer into stew-meat, which it usually sells for $6.99 per pound. The plant has typically paid about $3.50 per pound for the meat, plus another $0.80 for shipping. "We don't make money on it," says Noffsker, noting that NSEDC is a nonprofit (pers. comm., 6 November 2018). Noffsker says the store tries to keep the price at around this level so that it is affordable to elders and people on limited incomes (Justin Noffsker, pers. comm., November 6, 2018).

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amount of reindeer meat that AC stores use, if they are assumed to remain consistent throughout the year, and if an average reindeer weights 135 lbs., this indicates a total use of 17,010 lbs. of reindeer meat, or 126 reindeer carcasses.

Although my data are not conclusive, I suspect that the Kakaruk herd is the largest source of reindeer meat that Nome residents consume. The Kakaruk herd does not currently have a coordinated system of slaughter and distribution. As with other herds in the region, some Nome residents receive Kakaruk reindeer from relatives, but additionally, significant numbers also butcher Kakaruk reindeer along the Teller highway. In the survey data discussed above, respondents usually received reindeer meat from relatives in relatively small quantities—often 20 lbs. or less. Harvesting even a single animal produces about 100-150 lbs. of meat. My experience conducting this and similar surveys has suggested that rural Alaskans are far more likely to give away foods that they have harvested themselves than foods that they have received from others. Moreover, people are most likely to give away kinds of food that they possess in larger quantities. Among longtime Nome residents (even nonnative ones), I encountered a widespread awareness of Kakaruk reindeer hunting as part of local food production—although not necessarily a corresponding awareness of the complex social-political situation surrounding the Kakaruk herd (see chapter 3).

Nome residents sometimes eat reindeer meat as part of community events or other food service, although I did not specifically ask about these in the survey. For example, the Davises have mentioned donating reindeer meat for events such as native corporation shareholder meetings, as well as serving it at MSRR's 2016 and 2017 Reindeer Youth Summit events. Jimmy Pushruk has mentioned donating Kakaruk reindeer meat to the Nest, a homeless shelter in Nome.

4.3.2 Use and sourcing of reindeer products in Teller

Reindeer is one of the primary local food sources in present-day Teller, with almost all the households I surveyed having used it the previous year. In comparison with Nome, nearly all

of Teller's reindeer meat is sourced locally. Individual households obtain much of this from the tundra; only a small portion of Teller's reindeer meat is obtained and distributed through centralized processes of production and distribution. Even here, centralized harvests are coordinated through community institutions rather than through individual reindeer owners.

Because of the specific role that reindeer currently play in Teller's food systems, I will begin by considering their comparative role as a kind of large land mammal.[55] Large land mammals play an important role in Teller's food systems, but specifically categorizing them as a kind of "subsistence resource" may risk mischaracterization. One reason for this involves reindeer, which are plainly large land mammals but are not necessarily considered "wild" or "subsistence" (discussed above in 4.2.3: Local concepts: reindeer and "subsistence").

While local foods have plainly different culture significance than do products of industrial agriculture, I am wary of considering the two kinds of food in too absolute or categorical of a way. The narrative histories of particular ingredients are certainly important to Iñupiaq food culture, yet the processes of food preparation and consumption are also important to defining culinary identities (e.g. Spray 2002; Marte 2007). I have never heard beef described as traditional food. However, it is a dietary staple and seems to play a similar functional role to moose, caribou and reindeer, despite lacking their cultural significance. For example, beef is commonly used in similar food preparations such as soups and stews. None of this is to suggest that beef is seen as a culturally adequate substitute for these traditional foods; rather, it is to suggest that in practice, it is sometimes used to make do for them. To the contrary, the high quantitative ranking of beef may demonstrate that the availability of healthier, culturally-

[55] This organization reflects the methodology of my survey, which included sections both on reindeer in particular and large land mammals in general. I have not done this to the same extent in my discussion of Nome because I do not have enough data to meaningfully discuss comparative large land mammal use there.

preferred local meats is inadequate—especially given that its preferential ranking is lower than moose or caribou (as discussed below, in 4.4.2: Relative preferences for reindeer and other large mammals).

For these reasons, I eventually decided that it was worthwhile to consider beef in relation to other large land mammals.[56] My survey data suggest that it is the single most-consumed land mammal food source in Teller. Two successive survey questions asked respondents to rank different species of large land mammal according to 1.) use quantity during the previous year, and 2.) preference. (I consider the first of these here but will discuss preference further in 4.4.2: Relative preferences for reindeer and other large mammals).[57] In my initial design, the kinds of large land mammal meat I listed were caribou, reindeer, moose, musk ox, brown bear and "other (describe)." After completing the first seven surveys, I altered the methodology by adding "beef" to this list of large land mammal products. I decided to do this because multiple respondents mentioned beef when I asked about large land mammals. (I omitted these initial surveys in my analysis of these questions).[58]

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[56] To some extent, pork likely plays a similar role, but many of its products are quite different (e.g. bacon) than those common among game animals and beef (e.g. roasts, stew meat). Because of this, and the ways that I have seen rural Alaskans using these meats, I have assumed that beef parallels wild land mammals in a way that pork does not. I have not considered other possible store-bought substitutes for wild meat (e.g. store-bought chicken for wild birds) that are less directly relevant to the topic of reindeer.

[57] Survey question C.1 is as follows:
Please indicate which of the following large land mammals members of your household have eaten during the past year. Please rank these cards [shown in Appendix A at the end of the document] in order, starting with the ones that members of your household ate the most of during the past year, and moving toward those they ate the least of during the past year.
a.) caribou b.) reindeer c.) moose d.) musk-ox e.) brown bear f.) other (describe)
However, in variance with my written survey protocol, I did not actually use the pictorial cards for these questions, but instead prompted them verbally. I initially used the cards when administering the Nome survey but found them to be cumbersome and unnecessary given the relatively small number of possible choices.

[58] Altering the methodology after completing several surveys was a decision that I did not take lightly. The fact that my methodology did not remain consistent throughout the process presents challenges to the literal, scientific value of these survey responses. Yet because of the ethnographic focus of my research, and my concern with the relationship between different aspects of Teller's food systems, I deemed this

My results suggest that beef is the most-consumed land mammal among Teller residents, followed by reindeer, moose, caribou and then musk ox. No respondents reported using brown bear; thus, it did not function as a local food source in 2016-2017 and I omitted it from this analysis. Figure 4.2 shows the mean use (question C.1) rankings. I used IBM SPSS to calculate the statistical significance of these rankings via the Friedman χ^2 and Dunn-Bonferroni post-hoc tests, as outlined in the Analytic Procedures section of chapter 1 (1.5.5) The results of the Friedman χ^2 test are shown in table 4.3. Those of the Dunn-Bonferroni test, shown in table 4.4, indicate that not all the comparative differences in these rankings are statistically significant; comparative rankings that are significant are highlighted in table 4.4. However, even most of the comparisons that are not statistically significant (such as higher ranking of reindeer than moose) align clearly with both my other data and my overall perceptions from my time in the community.

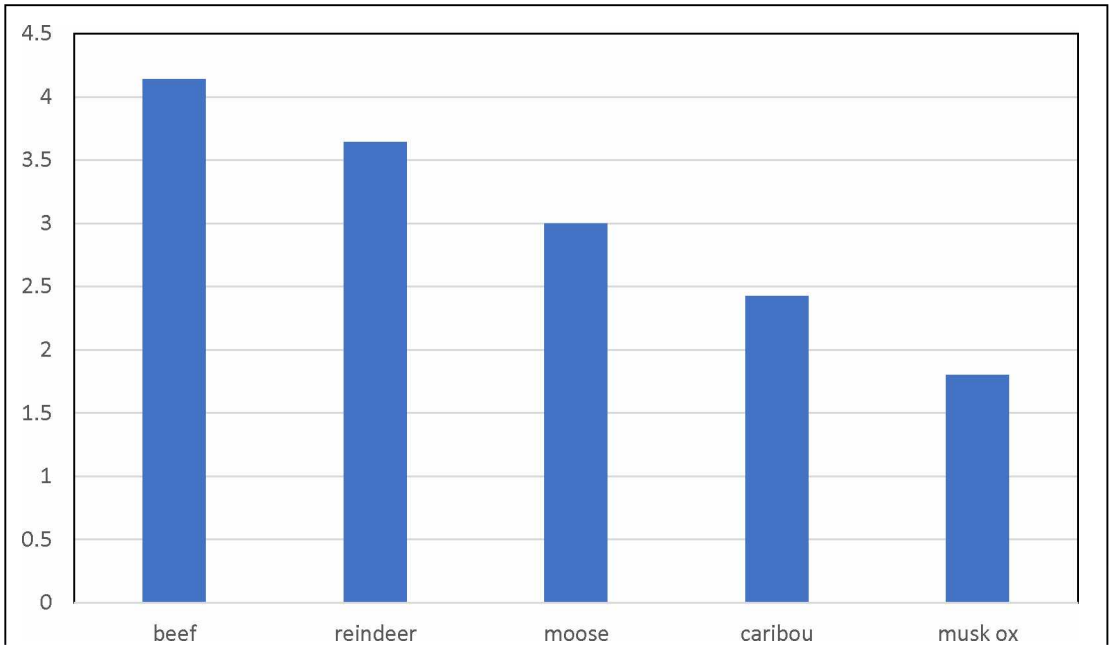

Figure 4.2: Mean ranked-order responses to survey question C.1 (comparative household land mammal use).

compromise to be worthwhile. If anything, I feel it would have been worthwhile to collect more data on attitudes toward store food.

Table 4.2: Mean ranked-order responses to survey question C.1 (comparative household land mammal use).

beef	reindeer	moose	caribou	musk ox
4.14	3.64	3	2.42	1.8

Table 4.3: Friedman χ2 test results for question C.1 (comparative household land mammal use).

Related-Samples Friedman's Two-Way Analysis of Variance by Ranks Summary	
Total N	42
Test Statistic	68.897
Degree Of Freedom	4
Asymptotic Sig.(2-sided test)	0.000

Table 4.4: Dunn-Bonferroni comparison for question C.1 (comparative household land mammal use). Statistically significant comparisons are highlighted in yellow.

Pairwise Comparisons for use rankings					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
muskox-caribou	0.619	0.345	1.794	0.073	0.728
muskox-moose	1.202	0.345	3.485	0.000	0.005
muskox-reindeer	-1.845	0.345	-5.348	0.000	0.000
muskox-beef	2.345	0.345	6.797	0.000	0.000
caribou-moose	-0.583	0.345	-1.691	0.091	0.909
caribou-reindeer	-1.226	0.345	-3.554	0.000	0.004
caribou-beef	1.726	0.345	5.003	0.000	0.000
moose-reindeer	-0.643	0.345	-1.863	0.062	0.624

moose-beef	1.143	0.345	3.312	0.001	0.009
reindeer-beef	0.500	0.345	1.449	0.147	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

None of my survey questions provided any data about actual quantities of beef that Teller residents used. I asked respondents which large land mammals they had harvested during the previous year, but the survey sought to specifically quantify only caribou and especially reindeer. Six respondents reported harvesting moose, while two respondents reported harvesting seven caribou. Mikow et al. (2018, 13) report that Teller residents obtained 15 moose in their 2015-2016 study period, or 31.6 lbs. per capita. No Teller residents reported hunting musk ox during the previous year. Musk ox were reintroduced to the area in the 1970s, but the state did not permit any hunting for them till 1996 (Dau 2000, 60), and still imposes heavy restrictions on their harvest. Although one survey respondent said he had hunted for brown bear the previous year, he did not report eating it. This is consistent with what I have encountered elsewhere in Alaska—brown bear is sometimes hunted for fur but is rarely eaten. One respondent said that eating bear was a tradition in the area that had vanished: "We used to eat brown bear long ago. […] The delicacy we would eat, would be eating the bear feet. I had bear feet on several occasions. […] Not many people eat bear maybe 'cause of the risk of trichinosis."

Both on the survey and elsewhere in my fieldwork, much of my data collection efforts focused on the role of reindeer as a specific food source. As we have already seen in chapter 3, humans interact with the Kakaruk herd though a relatively uncoordinated amalgamation of hunting- and herding-type activities. This is reflected in the local use of reindeer products in

contemporary Teller, products that a variety of individuals from the community obtain by butchering the animals in the open tundra. Often, this occurs without owner knowledge or approval, but sometimes it is done at owner request or as part of other social agreements. One respondent even reported that he butchered a reindeer on behalf of one of the herd owners, who did not have motorized transportation to access the herd. In exchange, this owner gave him approval to butcher another animal for himself. Reindeer in Teller is very much a locally-produced food source, with almost all reported reindeer use originating from the Kakaruk herd. This contrasts to Nome (see previous section), where most reindeer products are of nonlocal origin, sourced from throughout the region and beyond.

For the 2016-2017 study period, I estimate a total community harvest for Teller of 70 reindeer.[59] This includes individuals that I surveyed who reported harvesting reindeer for community events. From this, I estimate that these harvests yielded 43.2 lbs. of meat per capita for Teller residents,[60] or fell within a 95% confidence interval range of between 35.07 lbs. and 51.32 lbs. (±18.8%).[61] This 43.2 lbs. per capita equates to 0.83 lbs. of reindeer meat per person per week—or the equivalent of about two to four meals. Although the differing methodologies limit the value of comparing directly these data with those of ADF&G Subsistence, such comparison does offer a very general sense of reindeer's relative magnitude in comparison with other *Rangifer* in the region. Mikow et al. (2018, 6) report a Brevig Mission per capita caribou harvest 35.2 lbs. of 2016-2017—very similar to the amount of reindeer my data indicate that

[59] See the analytic methods section (1.5.5) for the procedure I used to obtain this result. The mean harvest from my sample was 1.03 reindeer. I extrapolated this to the number of households in the community based on information I obtained from City of Teller employees, who said that Teller had 68 occupied housing units at the time of my survey.
[60] See the Analytic procedures section (1.5.5) for the procedure I used to obtain this result.
[61] The 18.8% confidence limit indicates the range of likely discrepancy between the sample and the overall population. See the Analytic procedures section (1.5.5) for the procedure I used to obtain this result.

Teller residents have used. Yet as noted in the section on Changes, challenges and broader trends in rural Alaska food systems (4.2.2), many other Seward Peninsula communities have had far greater per capita *Rangifer* harvests.

Table 4.5 shows individuals who successfully harvested reindeer for personal use (i.e., I have not included reindeer that respondents said they harvested for community events). The maximum reported harvest by an individual was 12 reindeer, but he noted that six of these were harvested for local agencies. This respondent most likely harvested these on behalf of the City of Teller, which sends two of its employees every year to obtain animals for the annual Christmas feast (as noted in 3.5.1: Community relations to the Kakaruk herd).

Table 4.5: Number of reindeer butchered by respondents who harvested.

Number of reindeer butchered	Frequency
1	3
2	2
3	5
3-4	1
5-6	1
6	1

As indicated in figure 4.3, 94% of survey respondents reported that their households had used reindeer meat during the previous year. 31% of respondents said that their households had actually butchered reindeer themselves, while 61% reported receiving reindeer meat, but not butchering themselves. Only one of these reported receiving any from outside the community. Only 2% of households (i.e. one of the households surveyed) reported that they purchased reindeer meat but did not otherwise receive it. This respondent described purchasing three

reindeer from one of the owners for between $130 and $200 each.[62] Another respondent reported buying a steak from the Nome AC, but this is not represented in the graph because he said his household also received meat. Additionally, one respondent reported having traded for reindeer meat—exchanging salmon for it in this case. All respondents who reported not using reindeer meat were nonnative teachers from outside the region. On a year-to-year basis, then, reindeer is ubiquitous among Teller households.

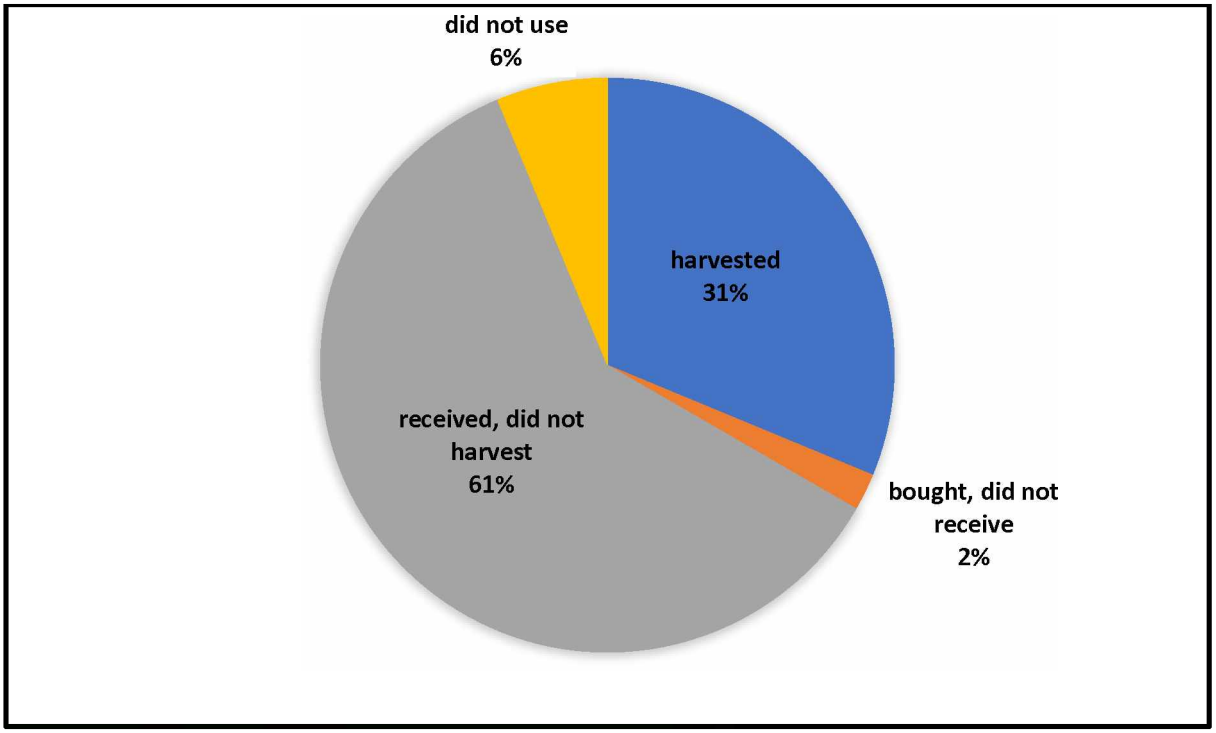

Figure 4.3: Teller households' reported use of reindeer products.

One respondent mentioned that the Teller store had carried reindeer from a processing company in Anchorage at one point during the recent past before I conducted this survey. The Teller store charged $25-30 per pound for it, he said: "Too outrageous. […] Nobody can afford that. […] I think anybody would just rather just buy chicken or beef." No survey respondents

[62] This is cheaper than the usual prices locals have quoted for purchasing tags (typically $300-400); the respondent noted having received a discount because of being related to the owner.

reported using any reindeer meat from the Teller or Brevig stores during 2016-2017. I did not ask respondents whether they gave reindeer meat away, but based on general patterns of resource sharing in western Alaska, it is almost certain that some reindeer meat was given outside of the community.

It is worth reiterating that these survey data do not capture the total magnitude of animals that are butchered from the Kakaruk herd. I have spoken with hunters from both Nome (see 1.3.2) and Brevig Mission who have butchered Kakaruk reindeer.[63] At this time, the Kakaruk herd is by far the most significant source of reindeer products on the southwestern Seward Peninsula. Ironically, then (given its relatively open management) Teller might be called a hub of reindeer production, as it has been at various times since 1891 (see chapter 2). Nome, by contrast, surely stands out as a hub of reindeer exchange for the entire region.

At the time I designed the survey, I did not have much awareness about selling tags; thus, I did not include a question about this practice specifically. (Question B.3.1, about buying reindeer meat, may not have been interpreted as unambiguously including this practice). While some respondents complained about the price of reindeer tags, none specifically reported purchasing them. It is not altogether clear to me whether this means that nobody purchased them, or whether it merely means that respondents did not think to mention that they had paid for reindeer permits. Because my conversations with many respondents were much more extensive than simply asking and answering the survey questions, I expect that if tag-purchasing were very prevalent at all, some respondents would have mentioned it. It may be the case that more Nome than Teller locals buy Kakaruk permits.

[63] In fact, Jimmy Pushruk and I encountered such a hunter from Brevig while traveling toward the Kakaruk herd, from whom Pushruk sought information about the animals' whereabouts (this was during the excursion described in the chapter 3 description of human interactions with the Kakaruk herd, 3.3.2).

4.3.3 Sharing, commodification and monetization of reindeer products

Unlike caribou meat, whose exchanges rarely involve money, and beef, whose exchanges usually involve money, both monetary and nonmonetary exchanges of reindeer meat have been customary in Alaska's reindeer herds. As of the late 2010s, only a small quantity of reindeer meat is involved in monetary transactions: Nome residents have used relatively little of it (see section 4.3.1: Use and sourcing of reindeer products in Nome), while Teller survey respondents have overwhelmingly obtained it nonmonetarily (4.3.2, Use and sourcing of reindeer products in Teller). Reindeer has potential for far more monetization than do wild foods such as caribou, but for various reasons it is often exchanged as a *de facto* subsistence food.

In Teller especially, exchanges of reindeer meat mirror the generalized reciprocity of other Indigenous hunting systems in the Circumpolar North (Collings 2010)—most exchanges of meat documented in my survey were given, rather than traded or sold. While I did not collect data on kinship, I hypothesize that patterns of giving coincide with kinship networks and other social structures, based on what I observed and patterns documented in other research (e.g. Dombrowski et al. 2013). 61% of Teller households reported receiving, but not harvesting, reindeer meat. During the course of the year, amounts received were as little as one pound and as much as two reindeer. Such sharing can still be understood as a form of commodification (Appadurai 1986, 12), particularly because of its interconnection with social obligations.

While reindeer was usually distributed in the same way as subsistence foods in Teller, its community feasts are an institution that involves reindeer in particular, as the object of a complex series of exchanges between community institutions and locals. Typically, a few such events take place each year: at Thanksgiving, Christmas, and sometimes for events such as the

Eskimo Games. Teller Native Corporation, which owns lands on the Kakaruk range, stipulates that the herders permit the harvest of several reindeer annually in exchange for its grazing permit. The City of Teller is tasked with this harvest, sending two of its employees to butcher the needed reindeer as part of their paid work time. Community members then help to cut apart the carcass—when I saw this (and helped a little bit), it was being done on the floor of the NVMI office (as shown in figure 4.4). Before the feast, community members can sign up to take home portions of the meat and prepare food items to be served at it. Reindeer meat is given out as door-prizes at these events. Pushruk (2017) has also mentioned donating reindeer for some memorial events.

Figure 4.4: Teller locals process a reindeer that was harvested for a community event on the floor of the NVMI tribal office. Photo by Odin Miller.

My survey documented few instances of reindeer meat sold or directly bartered. Only one Teller survey respondent purchased any meat, an elder who bought three reindeer from one of the owners, a relative. Another traded salmon for a small amount of reindeer meat. This pattern of commodification is ostensibly no different than that of many subsistence foods, cash sales of which are relatively common. In fact, in many parts of the Arctic wild foods are sometimes monetized to a level beyond what I have seen of Kakaruk reindeer (Gombay 2005). One Teller participant with whom I spoke about this topic easily quoted prices for a whole variety of local foods: seal oil, black (seal) meat, dried salmon, smoked salmon, berries. Unlike reindeer meat, however, selling these products in Alaska (other than perhaps berries) usually carries some degree of legal risk and social stigma.

Reindeer meat I saw in Teller—such as that shown in figure 4.8—was not presented in any way that distinguished it from subsistence foods. Even the package of reindeer meat wrapped in a garbage bag in figure 4.9 (for sale at the tribal office in another village) is presented as a more socially definitive commodity than what currently exists in Teller. Its poundage label is a demarcated criterion for determining a fixed exchange value.

Figure 4.5: Reindeer meat that a Teller family has thawed out for preparation. Reindeer meat is often presented in a way that is identical to that of caribou and other wild meat. Photo by Odin Miller.

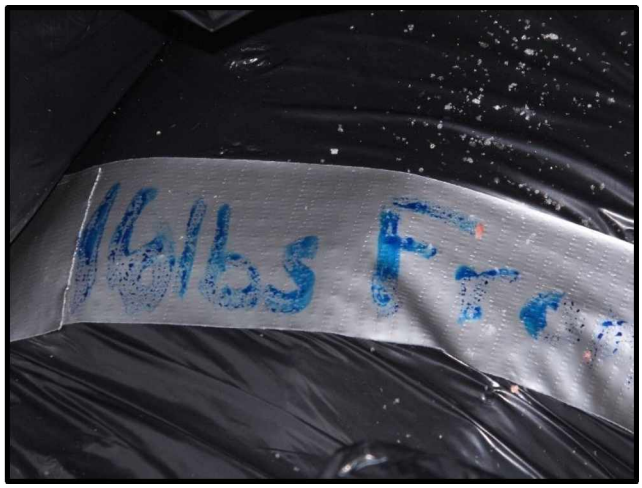

Figure 4.6: Reindeer meat for sale in another village is marked with a poundage label that is used to determine its price. Photo by Odin Miller.

Various research participants in Teller mentioned that herders frequently compensated their assistants in reindeer meat. This practice has been widespread and longstanding throughout Alaska; Stern et al. (1980) and others have documented "wage meats" as a major means of herder compensation for labor. Reindeer herding help includes both the small numbers of regular assistants who engage with the herd on the tundra, and much larger number of laborers needed on a short-term basis during roundup events. Often, herders have given helpers the choice of money or meat, as Pushruk (2017) described during the 2015 Kakaruk herd roundup. Reportedly, many people choose meat because the value of the meat offered is typically greater than the purchasing power of the cash compensation offered (i.e. the money would not be enough to purchase the amount of meat offered). One longtime herding assistant for a now-defunct Teller herd said that after the herd began to diminish, his compensation varied between money or meat depending on what resources the herder felt most able to spare. This assistant expressed personal loyalty and understanding of the herder's situation, not begrudging the lack of choice or the fact that his compensation was often deferred. In addition to paying meat as wages, herders have traditionally been expected to distribute reindeer products (and/or other gifts) among attendees at village roundups—which have been major community social events in villages (Olson 1969), including Teller.

In Nome, formalized exchanges of meat for labor have not occurred during recent years. The Davis herd is too small to sustainably slaughter many animals, and I do not know whether they would pursue this model even if they had sufficient numbers of animals. The Davises have relatives and friends who help them with herding on a volunteer basis and with whom they

sometimes share meat. Yet these exchanges are informal and not compensatory in any direct way.

In terms of both sources and kinds of transaction, Nome has had a much greater diversity of reindeer meat exchanges, despite their limited quantities. Community members receive reindeer products via sharing from relatives in other communities, order meat from the Savoonga herd, purchase tags to butcher Kakaruk reindeer, buy meat from a few different commercial vendors, etc. In this way, reindeer meat truly does occupy an ambiguous middle ground between monetary and nonmonetary economies. Some Nome residents expressed little interest in it due to the availability of caribou nearby, while others, such as those who are unable to hunt caribou, expressed a desire for greater availability.

During the late 20th century, herders generally sold meat very locally and for low prices. Jimmy Noyakuk said that when he began herding, he sold meat to Brevig for about $2.25 per pound. "When I first started I was making money off the reindeer antlers. That's what was keeping us alive," said Noyakuk (2017), saying that he only made money from meat when also selling velvet antlers. The velvet antler market is no longer thriving, however, and is no longer a viable economic driver for the reindeer industry. In the 2010s, visions for redeveloping the reindeer industry have placed greater emphasis on meat production. This entails charging more money for meat and potentially producing value-added cuts for higher-end markets such as restaurants. HLRM's Meat Production course has instructed students in cutting meat according to USDA standards and business specifications, says course instructor Jackie Hrabok-Leppäjärvi:

> When you are cutting the meat, you need—there's-there's meat diagrams, for the specific cuts—all components of the reindeer-meat. For example like rump-roast, the French fillet, the sirloin, tenderloin, the steaks. The rib-rolls. Uh, some of these might not be just

> everyday knowledge in the different villages, 'cause it's not part of the culture. But if you're trying to sell these different cuts of meat—something that's different than just soup-meat—you-you, you need to be formally, I'd say, shown, how to cut and why it's so important that it's cut this way—just exactly two-and-a-quarter inches is a acceptable steak for a specific restaurant (Hrabok-Leppäjärvi 2016).

As Hrabok-Leppäjärvi implies, producing meat as an intensively monetized commodity requires following sets of standardized procedures rather than traditional methods. It is interesting to note that Alaskan reindeer herders have long shown active interest in optimizing (formal) economic output. Toward this end, they have not been averse to accepting or even soliciting training or recommendations from outsiders with formalist expertise, such as from RRP, the HLRM program, or researchers offering ways to optimize output (e.g. Greenburg 1984). In this way, the orientation of reindeer herding appears to differ from that of hunting and other traditional, nonmonetary activities.

No herders have yet been able to actualize high-end meat sales. Because many such markets require constant supplies, accessing some of these markets depends on herders' ability to precisely control the timing of its production, in addition to the process and conditions. This, in turn, depends on herders' control over their animals. Yet it can be difficult to maintain control over open-range animals, particularly in a remote region with little infrastructure and often-unpredictable weather. The Savoonga herd, which has so far commercialized its meat production more than others in the region, has had difficulty butchering in winter 2018-19 due to bad weather (Richmond Toolie, pers. comm., 22 February 2019).

4.3.4 Economic interests of herders and nonherders

Bruce and Ann Davis (2016) have described reindeer herding as a "subculture" involving a small subset of the population within broader Iñupiaq culture. While herding has had limited efficacy in shaping broader Iñupiaq worldviews (Simon 1998, 282; Ellanna and Sherrod 2004), it has become an important tradition for herding families, with its own canon of traditional knowledge.[64] Likewise, the economic activity associated with herding has tended to radiate outward from the owners, with members of their extended families getting most of the employment opportunities (Stern et al. 1980; Simon 1998, 262-263). For this reason, community members without strong family ties to herding tend to have economic interest as consumers of reindeer products, but far less connection with the value generated by their production. Access to and exchange value of reindeer products, then, is an area of ongoing negotiation between these different community interest groups, the contours of which are shaped by the communities' broader food-economies.

During late 20th century, the high profitability of velvet antler sales probably relaxed profitability pressure on meat sales, as noted in the previous section. Although Finstad et al. (2006, 39) have stated that herders have regarded meat as their economic mainstay, antler clearly generated a large proportion of herders' income during its heyday (Jernsletten and Klokov 2002; Carlson 2005). Finstad's et al. assertion may reflect the fact that meat can be sold at any time of year and that its value is less tied to volatile markets. Still, the monetary power of antler often made reindeer herding quite lucrative, even if meat was being sold at near production cost (e.g. as Jimmy Noyakuk implied in my 2017 interview with him). Cultural expectations that herders

[64] Reindeer domestication/management, range management, velvet antler knowledge are examples of knowledge specific to herding. Much of this knowledge has been co-developed by the herders themselves, the Sámi who herded in the region prior to the 1937 Reindeer Act, and agencies involved with related scientific research and its dissemination to herders.

embody Iñupiaq social values of generosity (Simon 1998; Olson 1969) have tended to put downward economic pressure on the exchange value of meat. While velvet antler generated revenues from outside markets, meat was mostly distributed and consumed within the region, where its value was limited (Beach 1985). In a sense, antler production subsidized the production of meat as an affordable local food source.

Herders who have actively pursued business development during the 2010s have generally been exploring models that do not rely on velvet antler sales. Instead, they seek to increase the profitability of meat and other sources of revenue. Since incorporating as White Out Reindeer in 2017, the Savoonga herd has been selling meat for $5-8 per pound (Richmond Toolie pers. comm., 22 February 2019). Elsewhere, I have observed and heard reported lower meat prices—often in the range of $2.25 to $3.50 per pound. These have reportedly remained fairly constant over the past few decades, despite steady increases in the costs of equipment and supplies.

Setting prices based on market values and desired profitability can conflict with Alaska Native cultural values of generosity. Even herders actively involved in business planning have often articulated that local communities and (in recent years) food security are concerns that drive their involvement in herding. Greg Finstad, who supports the development of reindeer herding as a commercial industry in his capacity as RRP director and HLRM instructor, describes a recent trip to Savoonga:

> I was just out there for slaughter. And they were selling meat locally. And-and I know the guys that were selling it, said, "geez I have a hard time selling the meat, especially to the elders. I just want to give it to 'em." And—but that's not a viable business model, if-if you give away your product. But you-you could set it up where, uh, if you do have

> commercial sales, to support your business, you-you could—you could have a program where you could give meat away to the locals. Or at a reduced rate (Finstad 2018).

Finstad's proposition here is not completely dissimilar from the past juxtaposition of outside high-value antler sales and local, relatively inexpensive meat distribution. Nome butcher Howard Farley described having done something similar when he marked up reindeer steaks and roasts while selling stew meat very cheaply (see chapter 2, 2.3.8: Meat distribution and consumption [during the 1960s-1980s]). In fact, some herders have used preferential pricing schemes even for regional-scale meat sales. Tom Gray (2016) mentions that he sold reindeer meat for lower prices in his hometown of White Mountain than he did elsewhere in the region: "I used to sell reindeer meat to Joe Blow in Unalakleet for 3.50 a pound. Well, I would sell meat to White Mountain for 2.25 a pound. So they get a benefit out of the reindeer herd because it's eating on their land and it's right there in their region." In one community I previously visited, where the tribal government owned interest in the local reindeer herd, I saw that the reindeer meat for sale at the tribal office was priced lower for tribal members than for the general public.

Where reindeer is sold monetarily, Nome and Teller participants have often equated it with beef and sometimes expressed unwillingness to pay more money than beef would cost locally. One Teller survey respondent said that she prefers and uses more beef than reindeer "'cause it's cheaper. Reindeer costs too high in the store." Another said, "If it's higher than the store-bought meat, I'd buy the store-bought meat." Nearly 30 percent of Teller have incomes below the 125% of the federally-defined poverty threshold (Alaska Department of Commerce 2019), limiting their ability to purchase more expensive meat. However, more than 70% of Teller

survey respondents said they would replace at least half of their beef with reindeer meat if the cost were the same.

Nome respondents expressed similar views, such as, "I think if it were for sale at a competitive price people would buy it 'cause people prefer it." A number of Nome respondents cited expense as one of the main reasons they had not used reindeer meat, or had used very little of it. Said one, "I've gone to the store and tried to buy that meat but it's just way—you might as well be buying gold. The couple times I have bought from the store, we buy it for my brother—he lives in California." In particular, some of them referred to meat sold at AC for $12.99 per pound as too expensive. One longtime Nome resident, a retired professional, said that given the high cost of living, she could not ordinarily afford to spend more than about $4 per pound on meat. In both communities, some respondents expressed disinterest in buying reindeer meat given the ready availability of wild meat like caribou. Said a Nome respondent: "We don't normally do reindeer as part of our subsistence 'cause you have to buy it. We generally go after the wild."

Caribou have vastly different economic significance to herders than to hunters who are not connected with herding. While I spoke with many people who had favorable views of reindeer herding, non-herders in the region clearly also tend to hold positive views of caribou because they have provided a significant source of meat to local communities. One longtime caribou hunter suggested that, in practical terms, caribou hunting provided access to much larger amounts of meat compared with the cuts of reindeer that were usually available for purchase during the 1980s and 1990s (Ashenfelter 2018). When migrating caribou recruit reindeer from organized herds, they immediately alter the rules by which nonherders can acquire them, changing them from privately-owned livestock that cannot be harvested without permission to

feral, *de facto* game animals that any hunter may harvest (Beach 1985). Many in Northwest Alaska prefer the taste of reindeer meat, and even those quite friendly with herders have described shooting feralized reindeer in this way, as Roy Ashenfelter (2018) recalls his father doing during the 1970s.

Beach (1985, 9) further suggests that caribou presence has had the ancillary effect of eroding local value of and demand for domestic reindeer. While non-herders often must purchase reindeer meat, they do not pay directly for caribou meat. However, White Mountain herder Tom Gray suggests that the equipment and supplies needed for caribou hunting tend to cost more than would an equivalent amount of reindeer meat:

> I do know that I can prob'ly survive on, oh, maybe—you know my wife and I—maybe five or six caribou a year. If that's all we ate was caribou meat, and fish, and subsidized some of the other stuff, um, prob'ly five or six caribou a year. Um, now five or six caribou—at today's prices, um, a reindeer can run from five to six hundred dollars an animal—maybe 700 dollars an animal. And that's 3,500 dollars a year. Um, whether-whether people want to admit it or not, 3,500 dollars a year—I look at it as, a business venture. They say, "well I went out and I got free caribou and I, I put it in my freezer and ate that all year." Well, sure you did—you have a 2,000-dollar sled; you've got a 12,000-dollar snowmachine; you pay seven dollars a gallon for gas—or five dollars a gallon for gas. You can't tell me that that 3500 dollars for that meat isn't coming out of your pocket to go do subsistence (Gray 2016).[65]

[65] The range of prices Gray quotes here, $500-700 per animal, equates to about $3.70-5.20 per pound.

In part, Gray speaks to the psychology of purchasing meat versus harvesting it. While harvesting caribou may ultimately incur more costs, these costs accrue more indirectly and over greater spans of time and space. By contrast, purchasing meat involves a singular, direct exchange of money for food, the overall cost of which is more immediately apparent. Experienced hunters have reported that costs can vary widely from year to year, depending on factors such as ease of finding the animals.

Iñupiaq hunters often speak about the cultural value inherent in food production activities. In this way, the value of hunting would seem to include not only the production of "naturally-sourced food" (in the words of a survey respondent), but also the experience of reproducing a connection to the land and animals. I paraphrased one survey respondent as saying, *Picking out your own caribou is better than buying reindeer*.

Nevertheless, selling reindeer meat makes the product accessible to people who are unable to hunt and do not have relatives who bring them wild meat. Others have suggested that rising costs and declines in WAH may make buying reindeer meat more economically compelling than hunting. "Because the caribou herd is declining and there's actually a bag limit […] it gets to be a issue of the cost of going out hunting. […] If those costs keep rising, then I think reindeer at a supermarket is gonna be more appealing," said one Nome respondent.

4.4 Reindeer and food culture

4.4.1 Reindeer and taste

The concept of taste has two interrelated meanings as considered here: 1.) gustatory and other sensory qualities of food, and 2.) relative preferences and attitudes toward different foods. The first of these is extremely complex and has been the topic of considerable anthropological

study (*see* Sutton 2010); I touch on it only very generally. Although the second meaning I have given is broader, it interacts closely with the first: culture mediates sensory perception, while the particular kinds of sensory experience available within a given culture's environmental context influence facets of that culture. For example, I have previously mentioned that Alaska Native residents of Nome are more likely to have a taste for marine mammals than are nonnative ones. This well-known fact reflects Iñupiaq and nonnative cultures' disparate histories of cohabiting the region with these animals and engaging with them sensorially.

Of course, the cultural construction of taste is dynamic; it can vary from one generation to the next, or from one location to another within the same cultural environment (Dufour et al. 2013). I have seen some indication of this with reindeer and caribou. Teller locals indicated a clear preference for reindeer over caribou in their responses to my survey, reflecting its ongoing availability and role in shaping local food culture there. Yet in much of the region, reindeer has been largely unavailable during the past few decades. Many people in Nome have expressed that they are relatively unfamiliar with it and/or do not particularly prefer it. White Mountain herder Tom Gray has suggested that while elders born in the 1930s and 1940s largely prefer reindeer meat, tastes have been shifting with the absence of reindeer and the increasing prominence of store-bought meats:

> I caught the tail end of the people that grew up on reindeer. Um, and now those people are 80 years old. And when I was involved with 'em, you know, they were 60 or 50, or whatever, and they, they didn't care what it cost. They: "I want reindeer. Send me a reindeer and send me a bill." And, so I had a client list, a big list that—of the old folks that grew up on it. Today, you don't have people that grew up on it. They're-they grew up on chicken and beef and hot dogs and that kind of stuff so they haven't. I mean they've

had moose meat and they've had caribou meat and stuff like that, but their main diet, today—even my main diet. You know I've got five freezers full of native foods, but, um. You know, I don't—I eat a lot of moose and caribou and musk-ox and that kind of stuff. But, you know, prob'ly a third of my diet is ribeye steaks and chicken and whatever [...] (Gray 2016).

Of course, preferring the taste of one variety of *Rangifer* over another implies that they taste different. I did not ask extensively about the particular sensory qualities of reindeer versus caribou meat during my research, but many locals indicated that they find their tastes to be at least a little bit different. One survey respondent described caribou as "tougher," and elsewhere I heard it described as leaner and more gamey. This is consistent with my own perception from eating both reindeer and caribou at various times and in various places over the years. Carlson Tingook (2017) of Teller, describes reindeer meat as more "tender" and caribou as "kind of stringy, a little bit." Some expressed quite strong preferences for one other the other, as discussed below. A few people mentioned that they had not noticed any taste difference between reindeer and caribou.

It is likely that where commercialization has been associated with reindeer herding, it has had some influence on taste preferences for it. Traditionally, Iñupiaq hunters tried to kill animals in ways that minimized the amount of spilled blood, as the blood is an important source of calories and nutrients. This is exactly the opposite of the approach taken by contemporary reindeer herders, who often prefer to drain all the blood so that it does not alter the taste of the meat. In one instance, an avid hunter who had married into a reindeer herder's extended family

mentioned that spending time with the herder had made him far more meticulous about how he gutted the animals.

Meat Production is one of the main courses offered as part of the High Latitude Range Management (HLRM) program—a certificate offered through UAF's Northwest Campus with coursework emphasizing different facets of reindeer herding and natural resource management. This course takes a hands-on approach toward producing meat according to metrics of taste and quality rooted in western science. According to instructor Finstad:

> We'll talk about meat quality. […] After the lecture we'll go over and I'll have different cuts of meat and a pH meter, where the students'll have to take a pH, of, of these different cuts of meat and compare, the pH and they'll have to tell me, what they just learned in lecture, how come the pH of this piece of meat is different than this piece of meat. And- and I'll also have them look at the connective tissue structure under a microscope. And- and we'll—"OK, see this piece of meat has more connective tissue? Then, what does that mean for tenderness?" (Finstad 2018).

The meat-production course also instructs students on proper adherence to the US Department of Agriculture's slaughter, processing and storage guidelines, thus seeking to facilitate possibilities for commercial sale. Members of the Davis family have taken this course, as have other herders such as those from St. Lawrence Island.

Environmental factors influence the taste of meat from particular animals. Most commonly, people expressed a preference for animals killed at a particular time of year, such as early fall before rutting season. One Teller herding expert expressed distaste for "corral meat"—meat harvested from animals during a corralling:

> […] Corral meat always had that taste, you know, 'cause they ran ‘em around in the corral—we tried to butcher ‘em as soon as they come in or butcher ‘em out of the corral before they came in […] Yeah they get strong like, from the—I think they're peeing all over the corral and sweating and they kinda get that taste. […] I never did, uh, take meat from the corral—I'd always let ‘em know I'll get mine later out in the country when they're rested and not sweaty and—but I ate it, it—you had to get used to it (Okbaok 2017).

Okbaok mentioned that the taste became noticeable after the animals had been in the corral for 24 hours. I do not know whether this opinion is widespread. Herders such as the Davises have particular preferences about how the circumstances of slaughter affect meat quality, but have not been averse to slaughtering animals at the corral. In fact, some herders seem to prefer corral slaughtering because it enables more precise control over the circumstances of slaughter and processing.

A few locals have also mentioned place-based differences in the qualities of different herds within the region, although specific example of this in my data are based on reputation rather than direct sensory comparison (it is worth reiterating, though, that this is important to the cultural construct of taste). Tingook (2017) mentioned having heard about these differences: “I’ve always heard about, um, how the reindeer here is different compared to other places ‘cause of, um, the grazing area is—the feeding is different. I think the food is a little bit, different.” I have heard a few people extoll the taste of Savoonga reindeer; one nonnative participant from Nome described it as “good fucking reindeer” (but has also complained of its expense). These kinds of perceptive distinctions parallel the French (now globalized) concept of *terroir*—the notion that the environmental and cultural nuances of different places are manifested as subtle

differences in the tastes of food originating from them (Trubek 2008). Yet the gustatory distinctions perceived in these foods cannot be meaningfully separated from the broader associational significance of their places of origin.

In contrast to *terroir*—which implies granular discrimination between food products based on place—reindeer can function as a coarse symbol of Northwest Alaska, or of the Arctic more broadly. This culinary meaning of reindeer mainly seems to resonate with relative outsiders to the region, and as explained in the Theory section of chapter 1 (1.4), reindeer is effective in this role because it can be commodified and commercialized. A few nonnative respondents made comments suggesting that they might give reindeer meat or sausages to family members from outside as a taste of local food culture. One respondent said that he had FedExed the sausages to his parents in Chicago.

4.4.2 Relative preferences for reindeer and other large mammals

One of my survey questions (C.2) asked respondents to rank caribou, reindeer, moose, musk ox, brown bear, beef and "other (describe)" in the order they "value and/or prefer."[66] This does not specifically prompt for gustatory preference, but it does align with the second meaning of taste I have given above.

In the Nome survey, respondents gave a variety of preferences to this question, but a plurality of respondents listed moose as their top-ranked preference, with caribou second and reindeer third. I would interpret these preferences as reflecting, in part, the relative availability of

[66] *C.2 Please rank the following kinds of large land mammals, starting with the ones that members of your household value and/or prefer most, and moving toward those they value and/or prefer least: a.) caribou b.) reindeer c.) moose d.) musk-ox e.) brown bear f.) other (describe).*
This question is a direct follow-up to question C.1, which is discussed in the previous section, on Use and sourcing of reindeer products in Teller (4.3.2).

these animals. However, some respondents expressed definite taste preferences, such as: "I just like caribou a lot more for some reason. 'Cause I like lean meat." Another mentioned that her grandmother greatly prefers reindeer meat.

Interestingly, some Nome residents made comments suggesting a view of reindeer meat as a substitute for wild game: "I view reindeer the same as game as far as what I prefer." Some similarly said they would be more interested in reindeer meat if they did not have wild game available. This is another indication of the proclivity to associate reindeer with "subsistence." On the other hand, many emphasized the natural qualities of reindeer meat (and/or of subsistence foods) referring to it as "free-range," "natural," "local," "organic." Respondents often seemed to use these terms—generally used to label/market higher-end products of industrial agriculture—in a mildly ironic way, with the implication that reindeer is superior to imported grocery-store meats. Some Teller respondents used similar descriptions as well.

In Teller, reindeer was valued/preferred the most out of any kind of large mammal meat, followed by moose, then caribou and beef (which were virtually tied), then musk ox and finally brown bear. The data analysis procedures I used for this question were identical to those I used to analyze question C.1, about level of use (see the Analytic procedures section, 1.5.5, for more detail). As with my result in question C.1, the Dunn-Bonferroni post-hoc test indicated that some, but not all of the differences in relative rankings were statistically significant. Yet much like I noted in my discussion of question C.1, these rankings align with my overall impressions from my fieldwork in Teller.

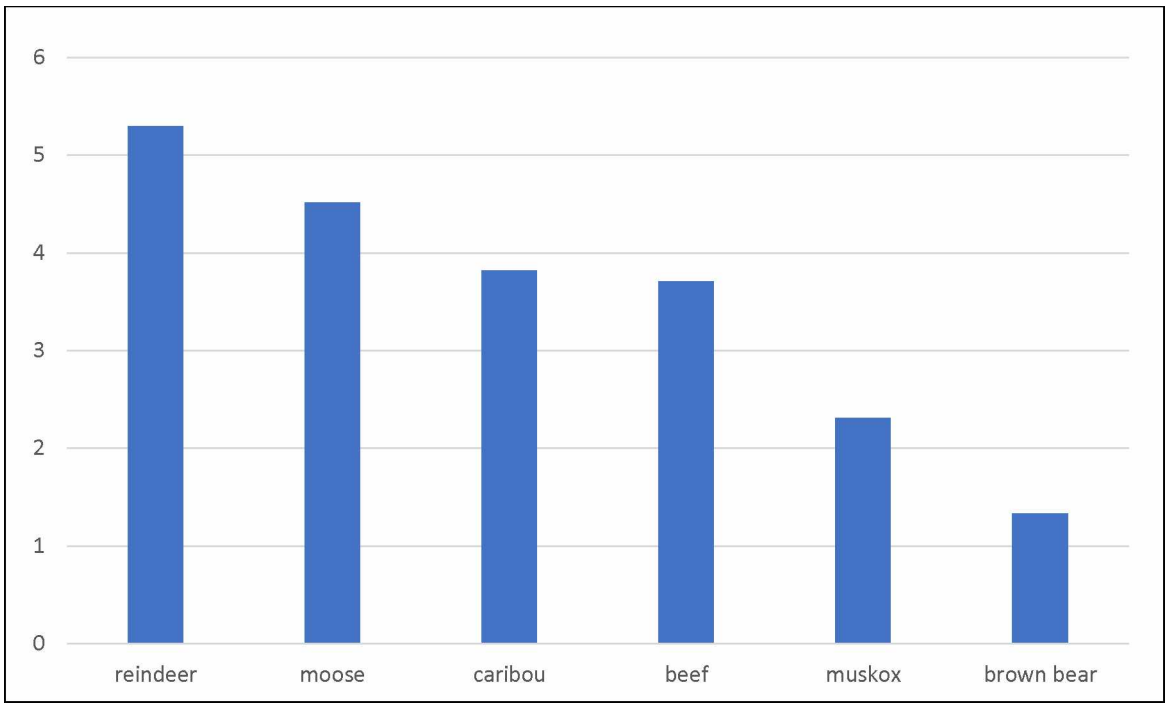

Figure 4.7: Mean ranked-order responses to survey question C.2 (comparative household land-mammal preference).

Table 4.6: Mean ranked-order responses to survey question C.2 (comparative household land-mammal preference).

reindeer	moose	caribou	beef	muskox	brown bear
5.3	4.52	3.82	3.71	2.31	1.33

Table 4.7: Friedman χ2 test results for question C.2 (comparative household land-mammal preference).

Related-Samples Friedman's Two-Way Analysis of Variance by Ranks Summary	
Total N	42
Test Statistic	132.150
Degree Of Freedom	5
Asymptotic Sig.(2-sided test)	0.000

Table 4.8: Dunn-Bonferroni comparison for question C.2 (comparative household land-mammal preference). Statistically significant comparisons are highlighted in yellow.

Pairwise Comparisons for preference rankings

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
brownbear-muskox	-0.976	0.408	-2.391	0.017	0.252
brownbear-beef	2.381	0.408	5.832	0.000	0.000
brownbear-caribou	-2.488	0.408	-6.095	0.000	0.000
brownbear-moose	-3.190	0.408	-7.815	0.000	0.000
brownbear-reindeer	-3.964	0.408	-9.710	0.000	0.000
muskox-beef	1.405	0.408	3.441	0.001	0.009
muskox-caribou	1.512	0.408	3.703	0.000	0.003
muskox-moose	2.214	0.408	5.424	0.000	0.000
muskox-reindeer	-2.988	0.408	-7.319	0.000	0.000
beef-caribou	-0.107	0.408	-0.262	0.793	1.000
beef-moose	-0.810	0.408	-1.983	0.047	0.711
beef-reindeer	-1.583	0.408	-3.878	0.000	0.002
caribou-moose	-0.702	0.408	-1.720	0.085	1.000
caribou-reindeer	-1.476	0.408	-3.616	0.000	0.004
moose-reindeer	-0.774	0.408	-1.895	0.058	0.871

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Relative preference for these mammals in Teller appears to correspond with their relative use, as discussed in 4.3.2 (Use and sourcing of reindeer products in Teller). Reindeer and moose are the most used—and thus familiar—of the local foods on this list. Beef is the most notable exception to this pattern, as it was the most heavily used, but not particularly preferred. Its ranking was behind reindeer and moose, virtually tied with caribou (insignificantly lower), and above musk ox and brown bear. Both Nome and Teller respondents expressed health concerns about beef. "Just because of chemicals and antibiotics I'd put beef at the bottom," commented one Teller respondent, a nonnative teacher. Yet there were relatively few complaints or other remarks specifically about beef. In Teller, my overall impression is that beef was not generally disliked, but was regarded as somewhat unexciting and perhaps generic. Most significantly, preferences for other large mammals were reinforced by their entanglement with Iñupiaq culture and identity; with beef, this was not the case. Some participants with good access to local foods mentioned that they occasionally eat beef or other store-bought meats because it adds variety to their diets.

Although some Teller respondents expressed preference for caribou, relatively few took particular interest in it. Many pointed out the fact that its availability is limited in Teller, and a few said they had not even tried it. Interestingly, one elder said she liked both reindeer and caribou, but disliked animals that were mixed, "I hate the taste of half-breed caribou and reindeer. Ick!" (Anon. 2018).

As a whole, Teller locals expressed limited experience with eating musk ox, and some expressed a lack of taste for it. "I tried it in the early years and I didn't like it. It has a real wild taste like tundra or something," remarked one survey respondent. Another viewed musk ox as unclean: "I see too many of them in the human shit-pile, eating off of the human toilets. Eww,

gross! No." Despite the general disinterest in bear meat, one respondent did speak positively of it, despite ranking it preferentially below all other mammals except beef: "That's kind of a specialty. [...] They're really good after the ground freeze. Better than beef."

4.4.3 Preparation of *Rangifer* products

Because food is imbued with many of its sensory qualities through its preparation, any discussion of reindeer's taste must also include consideration of how it is prepared and eaten. Throughout its Alaskan history, reindeer has adapted itself to Alaska Native, EuroAmerican and other nonnative cuisines. Yet to some extent this is also true of other kinds of local food—particularly ones like large land mammals that are compatible with EuroAmerican pallets. In this way, I have seen little evidence that reindeer has a unique culinary niche: reindeer dishes can generally also be prepared using caribou, moose or sometimes even beef, albeit with some differences in taste, smell, texture and cultural resonance. Here, again, the truly unique feature of reindeer lies in the particular circumstances surrounding its potential domestication and commercialization. As such, while this discussion's primary focus is reindeer preparation, a few of the descriptions and quotes about traditional preparation methods are actually in reference to caribou preparation. Again, while the taste of reindeer may be somewhat different, I see no evidence that traditional ways of preparing its products are distinct from those of preparing caribou. No research participants have indicated dishes that can be made from one variety of *Rangifer* but not the other.

Iñupiaq culinary traditions involve ongoing innovation and experimentation. In Nome, this is more likely to draw from global food culture, given its more cosmopolitan food systems (see 4.2.4: Nome: food systems overview). Yet village-based participants have also suggested

that gastronomic culture has changed in recent decades, with food preparers using greater varieties of store-bought seasonings and other ingredients, as well as preparing greater varieties of dishes. For instance, one HLRM student from Brevig Mission, who was born in the 1980s, mentioned that during her lifetime her family had begun using seasonings such as Lee & Perrin's (a brand of Worcestershire sauce) when preparing dried reindeer meat: "We would cut the meats in—kind of thin. […] Cut them kinda thin and, soak 'em like in Lee & Perrin's with other seasonings before we hang them—that gives them a good taste" (Adams 2017). On the other hand, reindeer herder Leonard Olanna, also of Brevig, describes taking a more conservative approach toward meat preparation:

> We've been living, how our parents, you know, taught us, to uh, prepare them, dry 'em. That's what we pretty much do. Nah, there's nothing different that how we make 'em I guess from how we were taught by our parents. […] Cook 'em and dry 'em. Pretty much that's it. On my side, anyway (Olanna 2017).

Soups and stews are among the most common and traditional uses of reindeer meat. These often include some combination of rice, noodles and vegetables such as potatoes, onions and carrots. In addition to meat, they often rely heavily on bones to flavor their broths. "When I get lots of reindeer I give away the meat and I keep the bone," said one elder from Teller, who discovered that she needed to use a large proportion of bone when making small amounts of soup for herself alone.

Many people also described making steaks and roasts out of reindeer meat, as well as grinding it into hamburger, a more recent phenomenon in Iñupiaq culture:

> There've been a few times where we've had a backstrap roast or a neck roast. But generally, we try to, um—we'll do anything like that—it's usually if one of the family members wants it for any occasion. If not, we just turn it into stew meat or grind up and of course, ground meat can be used for any variety of reasons, from—you know, hamburger, cheeseburger, hamburger soup. You know, tacos—I mean, just, you can turn it into any different style. And that's kind of what my family likes to do (Anon. 2017).

In addition to the meat itself, people spoke of eating heart, liver, kidneys, stomach, tongue, head, spine, marrow-bones, stomach, fat and hooves. While Nome participants commonly spoke of eating heart, liver and fat (usually when discussing caribou), Teller residents more often described eating a greater variety of animal parts. Some Teller locals said that some of these foods are preferred by elders, and that younger generations are not as interested in eating them. Yet Jerry Okbaok (2017) and others have suggested that younger people who have tried these foods have developed a taste for them: "Once you eat 'em a few times you'll […] you'll rather eat that than the meat." He harvests reindeer with the intention of conserving meat and other edible parts of the animals:

> When I go out and butcher reindeer I try and use a small-caliber gun and be right up close, like within—hundred-twenty feet away and shoot 'em once in the—behind the ear. That way you're—got the head to eat if somebody wants it. Then we'd have […] the neck, most people don't—some people eat it but if you shoot it behind the ear won't have too—won't have too bad of a blood—uh, blood-clotting. Like if you shoot it in the heart or lung you'll have the whole backside of the rib—you won't-can't eat that unless you clean it real good (Okbaok 2017).

Some described liver as a particularly prized organ, and one respondent mentioned receiving a piece of reindeer liver as a door-prize at Teller's community Christmas feast. People consumed it raw, fried, included in soup or stew, frozen and eaten with seal-oil. One hunter from Brevig noted that he prefers caribou liver to reindeer liver because the latter has an aftertaste, which he removes by marinating it in vinegar and then frying. Caribou liver he sometimes eats raw (Seetot 2018).

As with liver, Bering Straits Iñupiat have a variety of different uses for reindeer fat. It is commonly used in a sweet dish *agutuk* or *kamaamuk* (sometimes known colloquially as Eskimo ice cream), which includes berries, sugar, and sometimes seal oil or vegetable shortening that are whipped: "We call it *kamaamuk*. We could mix it with blackberries, blueberries and salmonberries. Lots of sugar—mix it with seal-oil—it's good" (Nome survey respondent). One survey respondent described whipping the fat and mixing it with meat. A few participants said they dry it; one describes eating dried fat as an energy snack: "That-that or along with crackers or, you know, some-something—because I know that once-once you have fat in the—in some form, solid or liquid or blubber, stuff—that's your energy food" (Seetot 2018).

Another widely-mentioned traditional food is the secondary stomach, or bible. Jerry Okbaok recalled saving these for his father to eat:

> Uh, my dad had me, only get the—try and bring the stomach home and like, one week after the willows turned green he'd want the parts of the stomach like the bible. He told me not to rinse it out very well and keep a lot of the greens inside. Just rinse it out just to get rid of the blood and whatever, got on there but, don't clean it real good. 'Cause they

kind of use the—it was mostly *sura*—the greens from the willow that was inside. What they ate (Okbaok 2017).

A few participants described eating hooves, skinning them and boiling them for a long time. Others mentioned cutting up heads and boiling them into soup: "Yeah, you skin the head and you just cut the head enough to, expose the brain and boil it. And some parts of the head, has lots of the meat on it that you cook also, that, just comes off like the way you do moose. It gets real tender, yeah" (Tingook 2017).

Heart and tongue are often made into a flour soup, which I was offered while in Teller. Lulu Menadelook prepared this by boiling cubed chunks of heart and tongue in a floury broth for several hours. Before we ate, she removed these chunks and served them on a separate plate—a practice I have often seen in various Alaska Native cultural contexts. We also ate black *muktuk*[67] and seal-oil with this meal. It was a cold, blizzardy evening and I found that the meal made me feel warm.

Figures 4.8 a and b: Flour soup prepared by Lulu Menadelook. Cubed pieces of heart and tongue are boiled with the soup, then removed and eaten separately.

[67] Black *muktuk* is blubber from a bowhead whale. Teller does not hunt whales, but other communities in Northwest Alaska do. *Muktuk* is distributed widely, through statewide exchange networks.

Michelle Adams of Brevig recalls how her grandparents made a flour soup using reindeer brain:

> My grandparents would um, saw or axe up the brain—I don't know. But make sure there's a crack in the brain and put it in a big pot. Once the brain is cooked it will come out. […] And they take the brain out and, she would make like a flour soup, like a cup of flour just mixed with water. Or other than flour we would use a um, Krusteaz pancakes mix. And just mix it full of water—not too thick, not too thin. Just like—just-just right. And after the brain boil, uh, just let it boil and put in the flour and let it--you gotta stir the flour--you gotta stir the soup as you're putting the flour in 'cause it's gonna get thick. Thick, thick but um, not too thick, not too thin. When you mix the flour in—like a cup and a half flour, then just keep adding water—not too thick; not too thin. And just stir it in with the brain. And it will form like a chowder (Adams 2017).

A number of respondents mentioned reindeer sausages. In Teller, many people expressed nostalgia for the breakfast sausages that the City of Teller's fish and meat processing plant produced during its brief operation during the early 2000s (see 2.4.4: 1990s-2000s: Changing community relationships to caribou and reindeer). One Nome respondent suggested that "this whole town" had eaten reindeer sausages during the Iditarod finish week, and my data bear this out: out of 33 respondents, 30 reported eating sausages with reindeer meat during the past year. Many such sausages are predominantly beef and pork (figure 4.10); some brands contain only minimal amounts of reindeer meat. Some respondents also mentioned purchasing the sausages for use at home. I did not investigate reasons behind the sausages' popularity, but their

availability certainly seems to have played a role. Vendors who sell the sausages at the Iditarod finish are clearly catering to out-of-town tourists. On the other hand, the sausages' popularity likely also indicates local demand for reindeer meat, and some respondents mentioned buying them at the grocery store.

Figure 4.9: Reindeer sausages for sale at Norton Sound Seafood Products in Nome.

4.4.4 Reindeer commercialization, culinary tradition and innovation

Like their economic relationship to the activity of reindeer herding, herders' relationship to their animals as food are potentially different than those of other people in their communities. The realities of this are somewhat complex, particularly where reindeer herding has not been highly commercialized. The reindeer *umialik* role described by Olson (1969), Simon (1998) and

others parallels that of other *umialit* who produced food for their communities as successful hunters. Descriptions of food preparation in the previous section were given both by people involved with reindeer herding and those who are not. I did not see any appreciable differences between the two, except perhaps that those involved with reindeer sometimes have more regular access to meat. However, interest in developing and promoting reindeer herding for commercial meat production seems to be driving changing approaches to food preparation among those connected with the Davis herd and/or the HLRM program. (This may also be true of the Savoonga herd, although I lack direct experience with it). As with herding activities (chapter 3), the Reindeer Youth Summit (RYS) events have functioned as a way of promoting food culture surrounding reindeer.

The Davises have shown strong interest in commercial meat production, but this is not yet a reality for MSRR. While the Davises' activities have occasionally involved public food distribution, this has generally been for purposes of education, reindeer-herding promotion or charity. As a fundraiser for the reindeer 4-H youth group, Scheele coordinated its members in preparing and selling reindeer ossobuco (a meat and rice dish of Italian origin) at the Iditarod finish in 2016. The family contributed to the book *EALLU; Indigenous Youth, Arctic Change & Food Culture* (Sustainable Development Working Group, 2017), an Arctic Council report featuring traditional recipes from different parts of the Arctic, including the Nome area. HLRM's Meat Production course includes an assignment in which students prepare dishes for potential commercial use. Here, Scheele said that some participants drew from culinary tradition, "We used recipes we knew and adapted from other meat. Or just favorites growing up, traditional" (pers. comm, 25 February 2019). Scheele said she and her husband made ossobuco for this assignment; two other students I know described making a pot-roast.

The Reindeer Youth Summit (RYS), an event held at MSRR in 2016 and 2017, is a major educational initiative through which MSRR has attempted to promulgate reindeer herding knowledge, reinforcing its linkages to food culture and Iñupiaq identity. The informational packet for the 2016 event states: "Blending Traditional Knowledge of reindeer herding, food culture, and actively engaging indigenous youth as real partners in this process are key elements of the summit" (Midnite Sun Reindeer Ranch 2016, 1). The summit's goal of acculturating youth also involved inviting elders to present their knowledge of reindeer herding and other topics such as medicinal plants. In this way it perhaps had some parallels to the "culture camps" that are held in different parts of rural Alaska during the summer, in which elders commonly engage in subsistence activities with youth.[68] I spent my 2016 internship at MSRR helping the Davises to prepare for the camp.

In 2016 the herd was not present at MSRR during the event, but a few animals were harvested from the tundra for use there. The 2016 event focused more particularly on food preparation than did the one in 2017, when the herd was present and much of the focus was on managing live animals. Norton Sound Seafood, a local seafood processing plant subsidiary to Norton Sound Economic Development Corporation, donated salmon, halibut and crab for the 2016 event. A week or so before GRYS began, I accompanied the Davises on a trip to the Nuuk Lagoon tidal flats, where we gathered *ikituq* (goosegrass, *Hippuris vulgaris*), an edible plant that grows in the intertidal mud. The Davises also had gathered some *tukkaayuk* (beach lovage, *Ligustum scoticum*), and some participants contributed foods like seal oil.

[68] NVMI Tribal Administrator Tanya Ablowaluk (2018) has described organizing such culture camps for Teller youth, as noted in 4.2.5 (Teller: food systems overview). I have never attended one, so I do not have a first-hand idea of how they compare to the RYS events.

During the GRYS, several women in the Davises' extended family spent long hours in the kitchen preparing the menu items, which included reindeer roast, grilled reindeer ribs, reindeer stew, grilled crab, grilled salmon, fry bread, cornbread, rolls, salad (which included local greens).

One participatory activity encouraged GRYS attendees to invent new recipes. Before dinner the first evening, everyone gathered at the tables in the dining area. Each table was given pieces of raw salmon and halibut. Ann Davis instructed us to work with the others at our table to make a sauce for each piece of fish, and a cabbage slaw. Ingredients were on a table at the front of the room, but we were to improvise our own recipes, which Ann and two others then judged.

Figure 4.10: Cook-off activity at the 2016 Global Reindeer Youth Summit.

In addition to suggesting innovation, the event was also an effort to connect with Iñupiaq culinary tradition. Scheele explained that the original idea for the event had involved sharing recipes as a way of building community interest in reindeer herding:

> We're trying to get out—get the word out, to the young people, the idea of reindeer-herding. And one of the things that we, we talked about is having recipes. To go ahead and share the recipes with the young people. Well you have to have people that know the recipes. They're most likely to be the older people. And what we did here is to get an environment together to where people would share the recipes, and also, um, have the young people, which we had the 4-H people and the High Latitude Range Management group come out here, to—all, to mix with the different, elders [...] So, people definitely had an interest in reindeer herding or reindeer. And people were, mixing together to share ideas (Scheele 2016).

I have not heard the Davises discuss recipes such as the head soup, hooves or bibles that Teller locals described in the previous section. HLRM students have learned to use some of these parts for nonmeat purposes—for example, reindeer brain can be used for tanning hides.

4.5 Nonfood reindeer products

Because food has been my primary concern, I have so far considered nonfood products only in passing—and given the importance and diversity of their use, even the discussion below is quite elementary. Seward Peninsula locals continue to put *Rangifer* fur, antler, bone and other products to nonedible use, but the use of these products from harvested animals is not as ubiquitous as it once was. In pre-contact times, caribou furs provided essential materials for

clothing, while Iñupiaq demand for reindeer leg materials drove their intercontinental trade with Chukchi reindeer herders (Ray 1975; Simon 1998). Burch (2012, 72-73) suggests that caribou's disappearance from the Seward Peninsula during the late 19th century was devastating to human populations specifically because Iñupiat did not have other suitable clothing materials at the time, although their loss as a food source also contributed to famine conditions at the time. Following their introduction, reindeer products filled the role that caribou had played earlier, although imported materials and goods gradually supplanted these for general use. During the late 20th century, of course, nonfood products became a major driver of the reindeer industry with the development of the velvet antler market.

At the present time, only a small minority of people in Nome and Teller actively use nonedible *Rangifer* products. In Teller, only about 15% of survey respondents reported that members of their household had used nonmeat reindeer products during the previous year,[69] while very few Nome respondents indicated they had. However, residents of Nome and other communities in the region use caribou products for the same purposes, although this was not a topic I discussed extensively with research participants. Some hunters have mentioned hide quality as a factor that may influence the time of year they hunt caribou.

Although only a relatively small percentage of locals actively consume nonmeat *Rangifer* products, research participants who have used them have continued using them for a variety of purposes. In table 4.11, I have summarized present-day, nonedible uses of *Rangifer* that research participants have mentioned or demonstrated. While some of these have actively evolved or

[69] This is in response to question B.3.2: *During the past year, has anyone in your household used any non-meat reindeer products, such as hides, antlers, etc?* As it is written, the wording is ambiguous as to whether this would include ongoing uses of products that were produced in previous years. When administering the survey, I prompted respondents specifically for new use of reindeer products to gain an understanding of their current consumption patterns.

developed during the more recent past, most are rooted in older Iñupiaq traditions. As in my discussion of food preparation, I have not attempted to separate "traditional" uses from "modern" ones because there is no clear boundary. Also, Iñupiat (and other Indigenous groups) have often emphasized the dynamism and adaptability of tradition (e.g. Raymond-Yakoubian and Raymond-Yakoubian 2015).

Table 4.9: Reported present-day uses of nonmeat reindeer products.

Hide	**Antler**	**Hoof**	**Brain**	**Bone**
insulating pads	fish-lures	fish-lures	tanning hides	other crafts
mattresses	jewelry	other carving		
mukluks	knife-handles			
stuffing for dolls	other carving			
	chew-toys for dog			

Hides and antlers are the most widely and diversely used of these products. Locals most commonly use hides whole, as an insulating material. In this capacity, their use is versatile: they can be used to line the bottoms of sleds, as mats for kneeling while ice-fishing, as sleeping mats, etc. Simon (1998, 292-293) pointed out their importance to Shishmaref during most of the 20th century, given the absence of caribou. This is a role that has also been filled by caribou when/where they are more widely available, the primary difference being that their production and distribution reflects the more decentralized nature of hunting as compared to herding (see chapter 3). Often these hides are used untanned, but one Teller respondent mentioned home-tanning hides. Use of these hides has probably declined during the past few decades. One Teller survey respondent mentioned that he stopped using hides as sleeping mats once air mattresses and cot mattresses became available.

Rarely do Nome or Teller residents make clothing out of *Rangifer* fur as the Bering Straits Iñupiat did in the past. A few participants mentioned a decline in this over the past several

decades. One Nome survey respondent mentioned having made caribou hides into mukluks during the recent past.

Antlers are unique in that reindeer shed them each year, and they can be harvested without killing the animal. In fact, some people mentioned that they obtain antler by gathering it from the tundra. Compared with hides, antler is more widely used to make products for sale, such as jewelry, figurines, knife handles, etc. They are one among many animal materials used to make salable arts and crafts.

The Davises, along with others involved in promoting the reindeer industry, have frequently emphasized the potential of reindeer for such uses. Scheele, who has sought to develop commercial uses for nonedible reindeer products, and has begun making them,[70] suggests that these are tied to Iñupiaq tradition through the value of non-wastefulness:

> […] In our culture and our tradition it's really important to use every aspect of every resource we have, so reindeer is a resource. […] you don't want to waste any aspect of it—you want to be able to put to use the antlers, the skull, the rest of the skeleton—even the non-edibles, right, the guts and stuff. […] That part tugs on us as Iñupiat when you see those things go to waste (Bonnie Scheele, pers. comm., 25 February 2019).

Elsewhere, she discussed educating her youth group about complete use and commodification of reindeer parts: "[…] every aspect of its body, not just meat, being used, um, to sell, basically. [...] in whatever capacity, as a finished product for arts and crafts or as raw material to supply to arts and crafts people for traditional uses and/or the modernizing that we're seeing happening" (Scheele 2016). From a formalist economic perspective, using all parts of a

[70] In fact, when I proposed to my fiancée Phoebe Rohrbacher, I gave her a reindeer antler ring that I had ordered from Bonnie and her husband Douglas Scheele.

carcass can increase its economic value: for this same reason, industrial livestock operations find markets for low-grade meat and nonmeat byproducts (Gewertz and Errington 2010). Because reindeer herding operations are generally small, remote and far from major markets (Koskey 2003), it has not been profitable to sell them commercially on a large scale. The Davises, as well as HLRM instructors, have expressed interest in creating value-added products from these as a way of increasing their profitability. Producing such value-added byproducts would be fairly labor-intensive. In order to sell their reindeer byproducts, the Davises would need to find people willing to purchase reindeer byproducts to use for this purpose. Like many communities in rural Alaska, Nome already has a lively trade in Alaska Native arts and crafts, both through formal sale (e.g. at local shops) and informal sale and barter.

Current visions for value-added nonmeat products are not solely informed by Iñupiaq tradition, but involve interaction with Sámi reindeer herders and UAF. HLRM instructor Hrabok-Leppäjärvi teaches courses in nonmeat processing methods such as hide-tanning. Hrabok-Leppäjärvi's instruction is heavily informed by Finnish Saami reindeer husbandry practices: her position at UAF's Northwest Campus involves spending half of each year at the Sámi Education Institute in Toivoniemi, Finland. While some of her lessons draw from Alaska Native traditions as well, much of the emphasis of her instruction seems to be on creating products that can produce value within a monetary economy:

> The traditions of the handicraft, of—and when handicraft it means not just the skins and furs. It means, the hard crafts of utilizing the hoofs, toenails of reindeer. Shin-bones, teeth. All—absolutely all components [...] there's no waste. The skulls, the brain, everything has its very specific purpose [...] I also do the value-added component and business aspect of how to make—how to show that reindeer herding—reindeer

ownership can be a full livelihood with these value-added, like products (Hrabok-Leppäjärvi 2016).

The Davises' receptiveness to this sort of instruction seems to indicate both a flexible approach toward the traditions associated with reindeer herding, and an openness toward institutional advice on microeconomic optimization (Wilk and Cliggett 2007, 56-72). The interest in adapting Sámi methods for producing nonmeat, value-added products also represents a continuation of the Sámi influence on Alaska reindeer herding that has been present since shortly after its inception (Postell 1990; Ellanna and Sherrod 2004).

The Davises have also expressed interest in collecting reindeer droppings and selling them as fertilizer to local gardeners. Such a use of reindeer products for secondary economic production could be seen as having a parallel in the early years of Seward Peninsula reindeer herding, when a surge in foxes (due to the prevalence of gut-piles from reindeer) spurred an increase in trapping (Ellanna and Sherrod 2004, 144).

4.6 Chapter 4 summary

Despite their shared geographic, cultural and historical contexts, Nome and Teller are very different communities in many ways. Nome is a large hub community with a relatively diverse population (including a large proportion of nonnatives), a more commercialized economy, well-stocked supermarkets, and generally less reliance on wild foods. Teller is a relatively small, Bering Straits Iñupiaq village whose current, permanent settlement occurred relatively recently. For many residents, wild foods form an integral part of the diet. Teller has

limited availability of grocery store foods, low per capita incomes, and a significant amount of household-level food insecurity.

We are can now address questions c., d. and e. as follows:

c. What are the general patterns of acquisition, exchange and use of reindeer products?	c. Reindeer can be commodified and monetarily exchanged to a much greater degree than caribou or other wild foods can, but for economic, institutional and cultural reasons, reindeer is prone to defaulting to modes of exchange that are nonmonetary or otherwise mirror subsistence patterns.
d. How does the social role of reindeer as a food source compare to that of caribou and other wild food sources?	d. While reindeer generally parallels caribou as a food source, its culinary attributes can potentially reflect both human control over the animals, as well as the interconnection of herding with globalized economies, institutions and modes of cultural expression.
e. How have changing relationships to food in rural Alaska influenced the way reindeer herding is conceptualized?	---

Similarly, Nome and Teller have quite different relationships to reindeer herding and reindeer products. Some of this can be explained by the demographic differences, while some of

it is a result of the particular development of human-reindeer-caribou interactions in the two communities. Reindeer does not form a major part of many Nome residents' diets. In part, this is because Nome's Davis herd is currently very small and is not producing reindeer meat for distribution to the general public, although it plans to do so in the future. Some Nome residents acquire reindeer meat in various ways, such as by receiving it from relatives in surrounding communities or by purchasing packaged reindeer meat at one of very few places where it is available locally. Most commonly, Nome residents use reindeer meat in very small quantities, although some harvest Kakaruk reindeer, or have recently ordered larger quantities from Savoonga's White Out Reindeer. Taken as a whole, the reindeer meat that Nome residents use is commonly acquired through both purchase and nonmonetary exchange (question/proposition c.).

In Teller a large majority of households use reindeer meat, sometimes in high quantities as a dietary staple. The vast majority of this reindeer meat comes from animals in the Kakaruk herd, and is hunted and distributed in a pattern similar to that of wild foods. While only a few Teller residents reported paying money for reindeer meat, some others paid for permits to hunt Kakaruk reindeer, although owners sometimes permit locals to hunt without payment, and locals indicate that there is widespread hunting without owner permission. As a consequence, Teller residents' relationship to reindeer closely parallels their relationship to other large land mammals and local food sources (question/proposition c.).

Current efforts to revitalize reindeer herding involve plans to use meat sales as an economic driver. This is somewhat different from the economic regime that prevailed during the late-20th century, when the high-value velvet antler market meant that reindeer herding could be profitable even when meat was sold for relatively low prices. Developing meat as a high-value

product requires producing it according to more institutionalized and globalized production guidelines, rather than through older methods specifically rooted in Iñupiaq tradition.

Reindeer is a local food to the Bering Straits region, and unlike other cultivated foods (garden products), it is typically seen as "Native food" among Alaska Native residents. Reindeer is not necessarily regarded as subsistence food or wild food, despite the fact that it is widely seen as part of Indigenous culinary tradition in the region. Alaska Native people use reindeer in a variety of traditional foods, in which it generally plays an interchangeable role with other large land mammals, and sometimes even beef. However, some residents express a preference for either reindeer or caribou, which appears to depend on its role in relation to their life experiences. For example, Teller residents' preference for reindeer over caribou reflects its availability, while in the rest of the region, older residents who grew up on reindeer are more likely to prefer it than are younger ones who grew up on caribou. In Teller, knowledge and use of a variety of traditional recipes appears to be more common; in Nome, by contrast, there are more culinary efforts seeking to connect reindeer (and traditional ways of preparing it) with contemporary global food culture (question/proposition d., question e.).

As I have pointed out elsewhere, both the Davis herd and the Kakaruk herd are quite unique, differing from other past/present reindeer herds in the region. Yet many of the underlying issues that this chapter has discussed are common among contemporary reindeer herding operations, and rural Alaska communities more broadly.

Chapter 5: Discussion and Conclusion

5.1 Economic implications of a specialized human-animal relationship

Because herding currently occurs within a social-ecological system that also includes caribou—and their contributions to human food systems—the topic has demanded consideration of the various patterns of human-animal relationships that occur in the region. In this regard, I have sought to contribute to ongoing discussions of human-reindeer-caribou relationships in Alaska, including Mager (2012), Colson et al. (2014), Plattet and Lincoln (2012), Burch (2012), Reedy (2016), Beach (1985) and Schneider et al. (2005). Yet I believe that the most important contributions to this conversation come from people with intergenerational experience of herding, hunting, taming, processing, preparing and consuming *Rangifer* products. Oral sources, such as those of UAF's Oral History Archives and Kawerak's Eskimo Heritage Program, are enormously valuable for this reason. I am not aware of any anthropological literature that has specifically addressed the topic of contemporary caribou hunting on the Seward Peninsula, although some basic ethnographic data can be found in publications such as Caribou Trails and ADF&G's TP series. While my focus has been primarily on reindeer herding, and I did not conduct participant observation of caribou-related activities, I have attempted to convey perspectives of Nome caribou hunters as part of my analysis. Seward Peninsula caribou hunting is a topic that warrants dedicated study and oral history documentation.

Among Seward Peninsula locals, there is a large range of attitudes toward reindeer, caribou and human ways of interacting with them. These attitudes and relationships are shaped by residents' divergent histories with the animals. Reindeer herders—and former herders who have lost their herds to caribou migration—are clearly unenthusiastic about the presence of WAH nearby, but many other locals feel oppositely. Nonnative people who are relatively new to

the region often have no particular connection to reindeer herding. Many established Nome locals have purchased permits to hunt Kakaruk reindeer, but unlike their counterparts in Teller, they often have not come into contact with the political controversy surrounding this practice. Most importantly, most Iñupiaq residents of Nome and Teller have very long cultural histories of interacting with *Rangifer*. For most of the past two centuries, there have been *Rangifer* on the southwestern Seward Peninsula, but only recently have both reindeer and caribou inhabited it at the same time.

Of course, herding entails a different kind of traditional knowledge than does hunting. In chapter 3, I have characterized herding as a more specialized human-animal relationship than hunting. Herding is specific to one variety of one species, and only a small portion of Seward Peninsula populations have been heavily engaged in it. The ongoing changes in hunting and herding practices have tracked with the massive cultural changes that the Arctic has undergone during the past 150 years (Burch 1975; Pelto 1973). In modern times, both activities involve the use of snowmachines and are based in sedentary communities. Unlike hunting, herding in Alaska has, since its inception, been intertwined with government agencies, globalized economies and western belief systems (Ellanna and Sherrod 2004). Yet its knowledge and practice have also been continuously connected with Iñupiaq culture. In this way, the ambiguities of human-reindeer relationships discussed throughout this thesis (e.g. as domestic versus wild animals) are natural consequences of its intensive interconnection with both local and nonlocal cultural/economic systems. Indigenous knowledge of reindeer herding has included knowledge of how to produce reindeer products for global markets, such as the knowledge associated with when to harvest velvet antler (Schneider et al. 2005; Henry 2002; Lynch 2018).

Koskey (2003) and others have suggested that tension between Indigenous values and commercialization is a common thread among modern herding groups. In fact, Koskey views this as more severe among the other three groups he considers in his comparative study (Norwegian Sámi, Russian Saami, Chukchi) than among the Iñupiat: "Of all the four case studies, it seems that a dissonance between reindeer herding as a capital enterprise and reindeer herding as a subsistence activity among the Iñupiat has been the least pronounced" (Koskey 2003, 247).

Although Nome has never been altogether free of reindeer-related strife, the community has generally seemed accepting of the Davis' active management in recent years. As a regional hub, Nome has long been more oriented toward capital enterprise than other communities in the region, and Lynch (2018) has suggested that the Davis reindeer herd has always had this general orientation. In Teller, reindeer have assumed the role of subsistence resource. While this has enabled open access among community members, I actually encountered quite a few locals who expressed unhappiness with the situation and rued the decline of its active management. Interestingly, some of these locals reported that they had engaged in unauthorized hunting, themselves. Among Teller community members, I encountered a general anxiety that the Kakaruk herd's pluralistic ownership and management situation is not sustainable.

As I have suggested at the beginning of this thesis, the long-term existence of domestic reindeer on the Seward Peninsula seems to be predicated on herders establishing their animals as "non-caribou." This includes both physical separation and human social recognition. Both of these goals are costly to achieve, as they require time, resources and social position within the community. Corralling is instrumental in the construction of reindeer domesticity, but as I have noted previously it is quite costly in terms of materials, human labor, and the accompanying

social obligation of generosity. Jimmy Noyakuk (2017) and Tom Gray (2016), both reputed as very dedicated herders, were forced to discontinue herding after their herds had gradually dwindled to the point of being economically unsustainable. This suggests that long-term active management of herds that do not generate revenue is often impractical. I believe this holds true even with herds that are large but consistently unprofitable, although the specific outcome of this unprofitability is different than with herds that are unprofitable because they are small. I would hypothesize that large herds generating little revenue are much more likely to transform into hunting systems by default, and to begin replicating human-caribou systems.

Under modern capitalism, then, perhaps reindeer's monetization is a large part of what defines it as separate from caribou. Yet dependence on monetization has its own vulnerabilities, particularly because Alaska's reindeer industry no longer has a high-value niche in the global market, as velvet antler once was (Jernsletten and Klokov 2002; Stammler 2004). Most importantly, reindeer herding continues to depend heavily on social relationships that are mediated by extended families, communities and Iñupiaq cultural institutions, rather than by money. In this sense, herding is inherently rooted in Iñupiaq tradition, involving community members in much the same way as other traditional activities.

5.2 Reindeer, food systems and adaptation to change in rural Alaska

The sparse representation of reindeer in food-related literature relates to the fact that reindeer herding is only a small part of rural Alaska food systems, even on the Seward Peninsula. By some measures, its nutritional contribution is relatively negligible: my data have shown that even the minority of Nome residents who use reindeer products typically use only small amounts each year. While it contributes significantly to the diets of people in Teller, Savoonga (Ahmasuk

et al. 2008, 113), Stebbins (Braem et al. 2017), St. Michael and perhaps Wales, most other communities in the region do not have reindeer herds at all. Yet reindeer herding has left a longer cultural-historical imprint than mere usage estimates indicate. Longtime Nome residents remember times when reindeer meat was more widely available, while many Alaska Native people in the region have relatives who have been involved with the reindeer industry at some point in the past. Plattet and Lincoln (2014) and Mager (2012) have shown that even in areas of Alaska with relatively short histories of herding, its legacy has continued to shape local culture, even many decades later. I have also observed this during extensive travel in the Kuskokwim River drainage before beginning this project, where I not infrequently encountered descendants of Sámi herders. On the other hand, some participants have implied that some locals—particularly younger people—do not value reindeer herding and/or products as highly as people did during past decades, when reindeer herding was a more pervasive part of local culture. Youth involvement in herding is a major concern of the RHA and of herders such as the Davises, as I have shown in the discussions of the reindeer 4-H Program and Reindeer Youth Summit.

Food systems are at the very nexus of human ecology (Sutton and Anderson 2009), and are thus inherently complex and multi-faceted. They can be approached from any number of perspectives, and even in a small community, it is highly doubtful that any individual study could detail all aspects of them in a systematic way. More importantly, ethnographic approaches do not always strive to be comprehensive, or even exactly systematic. Rather, many of them focus on elucidating particular relationships that are relevant to broader theoretical understanding of the subject. Yin (1994, 10) has suggested that this is a general goal of case study research, but it is more broadly true of other qualitative methodologies. More quantitative food systems research (e.g. subsistence survey projects, network analyses, formalist economic approaches)

achieves systematic results but is often less sensitive to interpretive realities. Although his primary concern is not food systems, Anderson (2000, 37) well articulates the qualitative orientation of his work, construing it as a portrait that "points to a trajectory whereupon those who hunger for knowledge can find a different dimension of experience." I interpret this as an acknowledgment that textual discourse is inherently limited in its capacity to convey the subjective qualities of cross-cultural realities.

Regardless of the approach, I have long felt that a certain amount of nutritional and economic pragmatism is warranted in studying issues like food systems. Because food systems are inherently interconnected with the topic of human well-being, approaching them from a purely theoretical perspective would imply an unnatural detachment. With some qualification, I feel that such pragmatism tends to be a cross-cultural value, and it is one that I certainly inferred from some of the Iñupiaq people I worked with during this project. As Elizabeth Marino (2012, 204-205) has written: "Putting away black meat is ritual. It is a practice in cultural expression; but it is not a reified Iñupiaq activity. It is not part of a living museum. Putting away black meat is what women do. It is both ritual and pragmatism." Despite large cross-cultural variation in the very concept of pragmatism, all humans have the same basic nutritional requirements for their biological survival. The contributions of particular food sources to these overall nutritional requirements—as well as their availability and stability—are important to understanding overall community food systems.

Yet beyond this, the very notion of a pragmatic research approach toward food systems is far from straightforward. On the one hand, meeting the nutritional requirements needed for mere survival in no way guarantees quality of life (again, this hearkens back to arguments that so many food ethnographers have made). In rural Alaska, lack of access to Native food is one factor

that drives outmigration to urban centers like Anchorage, where store-bought food, at least, is more varied and plentiful. Yet on the other hand, the construct of "preferred food" can be quite adaptable. As I noted in chapter 4, some research participants (e.g. Gray 2016) have mentioned that relative taste preferences for reindeer and caribou have undergone a generational change reflects the decline of reindeer and the availability of caribou. More generally, I have heard many examples of foods that elders prefer but that some members of younger generations dislike. Generally, these are foods that are unappealing to Euro-American palettes, such as nonmeat organs and some marine mammal products (cf. Yamin-Pasternak et al. 2014).

The rapid change in rural Alaska food systems has spurred dialog about how to balance cultural continuity against adaptation to change. Some keystone foods that were once abundant and accessible are increasingly costly and difficult to obtain. During a workshop I attended in 2016, which was part of a joint project between UAF and Nome stakeholders to develop the Nome Tribal Climate Adaptation Plan (Kettle et al. 2017), participants actively considered the role of tradition in adaptation. One participant described the difficulty of drying fish during the rainy weather that has become a new occurrence during fishing season, pointing out that "It's not a tradition; it's something new." Another spoke of the need for cultural flexibility: "[…] Everything changes all the time. That's just how the universe works: it's always changing. […] If we're trying to hang onto our *sura* [willow-leaves] and the whole environment's changing […] to me that's not adaptation."

Questions of tradition and adaptation are at the intersection of culture and food security. Many anthropologists and Indigenous scholars have framed the idea of tradition itself as inventive and adaptable. One Kawerak social science publication specifically includes change and adaptability in its definition of traditional knowledge—a definition developed in

collaboration with traditional knowledge-bearers from the region: "Tradition – and TK [traditional knowledge] – does not preclude change, nor does it equal 'the past.' In fact, it inherently entails change (e.g. in adaptation processes)" (Raymond-Yakoubian and Raymond-Yakoubian 2015).

Food production initiatives are one way of adapting to changing or vulnerable food systems. Of course, these are by no means the only adaptation measures—or even necessarily the most important ones—being considered in rural Alaska today. The Nome Tribal Climate Adaptation Plan (Kettle et al. 2017) enumerates eight "initiatives for specific action," of which four are directly food-related. All of these relate to traditional food/subsistence, rather than to horticulture, agriculture, store food, etc. Adapting and preserving the continuity of existing subsistence traditions seems to be the primary priority of rural Alaska food systems adaptation.

As a general social-ecological principle, diversification often creates greater capacity to adapt to perturbations (Chapin et al. 2009). Active diversification of food sources requires either cultivating food or introducing nonnative species to wildlands. Legal structures do not usually allow communities or tribes to initiate the latter.[71] Such concerns have invigorated both MSRR and the Unaatuq agricultural project at Pilgrim Hot Springs (see 4.2.2: Changes, challenges and broader trends in rural Alaska food systems). I have heard of several rural Alaska communities that have expressed some interest in starting community reindeer herds, as well as locals such as HLRM students who have goals of starting private ones. Yet rural Alaska communities, institutions and individuals do not have unlimited capital to invest in food production initiatives.

[71] For example, ADF&G introduced reintroduced musk ox to the Seward Peninsula in 1970 (Dau 2000:58). More recently, it has reintroduced wood bison to the Innoko River drainage in southwestern Alaska (von Ahnen 2016). These species have historically inhabited these areas; introducing nonnative species into the wild is far more controversial among biologists (Chapin 2009:39-40). Yet some have recognized that climate change will inevitably lead to ecological changes and have taken interest in small-scale ecological experiments along these lines.

Although NANA evidently devoted far more money and resources to its herding operations than most individual herders have had available, both economic and ecological factors made its ventures unsuccessful in the long term (see chapter 2). While reindeer may be a culturally preferred food, starting and maintaining reindeer herding operations can often be quite costly, difficult and tentative. No community in Northwest Alaska that has lost a herd during the past few decades has successfully reestablished one—most ostensibly because of continued WAH migration. I have been told that institutions in the North Slope region recently expressed interest in (re)establishing a reindeer herd there, but were advised that it was neither economically nor ecologically feasible.

There have been a far greater number of new agricultural and horticultural projects in present-day rural Alaska than there have been reindeer herding operations. Many of these are relatively small in scale (e.g. community gardens) and are undoubtedly cheaper and less logistically complex to start and maintain than are reindeer herds. However, no recent non-reindeer food cultivation project in Northwest Alaska has produced meat—or other major protein sources—let alone a kind of meat that many consider a traditional food. Reducing dependence on imported protein may require some form of livestock husbandry. Yet this is often an expensive proposition in rural Alaska, especially if feed must be imported. In Interior Alaska, Stevens Village has acquired bison in an effort to address food security concerns, but is keeping these animals at a farm in Delta Junction rather than in the village itself (Friedman 2018).

On the Seward Peninsula, the future role of reindeer as food may ultimately depend on the future of caribou. As discussed in 4.3.4 (Economic interests of herders and nonherders), this is an area where the interests of reindeer herders diverge from those of many of other members of their own communities (although, of course, neither group can control the presence or absence

of caribou). Wild *Rangifer* herds have proven vulnerable to climate change, roads, industrial infrastructure and other development: a recent analysis of 22 caribou herds found that 20 have declined over the course of the past two decades (Russell et al. 2018). Yet broadly speaking, both varieties of *Rangifer* have the same vulnerabilities to environmental change; domestic reindeer have also suffered dramatic declines throughout the Circumpolar North for many of these same reasons (Koskey 2003). Active reindeer management could theoretically anticipate and proactively adapt to such effects on the animals—for example, herders could help their animals to navigate industrial infrastructure or to find food after winter rain-induced icing events. In practical terms, though, climate change effects have often made it more difficult for herders to access their herds (Rattenbury et al. 2009). The Davises' keeping their animals in captivity has been one approach to this problem, but this has required costly inputs of supplemental feed, and has been untenable during periods with prolonged, heavy snow events. While caribou populations are generally in decline, their populations nevertheless fluctuate and their migrations are unpredictable. WAH population actually increased between 2016 and 2017 (Western Arctic Caribou Herd Working Group 2018), although fewer animals have wintered on the Seward Peninsula in recent years. Given past experience, it seems unlikely that communities or herders would attempt to establish new herds in areas adjacent to active caribou migration routes.

Yet given the state of caribou herds throughout the arctic, the disappearance of caribou from any particular area could conceivably be long-lasting or even permanent at this point. State and federal policies have facilitated the development of roads, mines and oil infrastructure in caribou migration routes, even though there is considerable evidence that these have had disruptive effects on their populations (Russell et al. 2018). Yet government agencies do not always take a favorable view of reindeer herding and sometimes impose obstacles or restrictions

on current or potential herding operations,[72] even though reindeer's impact on wildlife and other aspects of the ecology is surely less severe than large scale-industrial activity. Port Heiden, one of very few communities to acquire reindeer in recent years, has been unable to let its reindeer graze on open rangelands due to restrictions that the National Parks Service has imposed (Reedy 2016). On the Seward Peninsula this seems to be less of an issue: government agencies have continued to renew grazing permits, although most ranges do not currently have reindeer on them. This has created its own challenges, however: some young people have expressed interest in herding but there have been no rangelands available.

However, among the people engaged with the reindeer industry in various ways, I have generally encountered a fairly hopeful attitude about the future. One HLRM graduate has made active inquiries into the possibility of applying for an unused grazing permit. Another relatively young person, Roger Menadelook III (son of the herder Roger Menadelook; see chapter 2), told me that he hopes to reestablish a herd on the grazing area that his family still holds. Adapting to large-scale social and ecological change typically often requires calculated risk-taking, experimentation and a plurality of different approaches (Cumming et al. 2012). Perhaps this is reflected in some of the general interest in (re)developing reindeer herding in some rural Alaska communities, alongside a variety of other food-related projects. If the reindeer industry does undergo a resurgence on the Seward Peninsula, it will clearly have significant differences from the model that prevailed before the caribou returned.

[72] I should qualify that the individual government officials who work directly with reindeer herders—such as through the Alaska Reindeer Council (ARC)—often seem to take personal interest in reindeer herding and its success. Many of these officials have developed friendly relationships with the herders, and have attended the Reindeer Youth Summit events that the Davises have held. Moreover, ARC meetings provide a forum for open communication between herders and these officials.

5.3 Further research opportunities

Because I hope that this thesis will generate interest in future research on this topic, I would like to point out a few limitations and/or areas that were beyond the scope of this analysis, and may be worthy of further, follow-up study.

5.3.1 Women's roles in contemporary reindeer herding and food preparation

I worked extensively with a number of women during the course of my fieldwork, yet conducted a preponderance of formal interviews with male key respondents. Most reindeer herders and caribou hunters I encountered in my research were men, although participants described how cultural changes have allowed for greater women's involvement in these activities during the past several decades. Given the fact that gender relations are quite peripheral to the subject of this thesis, I feel that this change is adequately reflected in the assortment of key respondents and other research participants.[73] At any rate, this is an interesting development that is worthy of further study.

Ironically, where I feel the perspectives of women are most ostensibly underrepresented is in my discussions of processing and food preparation (4.4.4: Reindeer commercialization, culinary tradition and innovation)—activities that have traditionally been the province of Iñupiaq women. Here, many of the ethnographic descriptions I have referenced were provided by male interview respondents whom I interviewed because of their experience with herding or hunting activities. Having compiled all these interviews, I recognize that I might have made a more

[73] One of my interview respondents, Tanya Ablowaluk (2018) is a woman who is a very active hunter in Teller. Cheryl Lynch (2018) has characterized her father, Larry Davis, as relatively egalitarian for his time, but noted that there were limits to her direct involvement in herding activities. Lynch's niece, Bonnie Scheele (2016), who has been able to participate in all aspects of herding, gave her grandfather some of the credit for a family culture that evolved to facilitate her full involvement.

deliberate effort to interview women experts on food processing and preparation. On the other hand, the sourcing of my data has been diverse. In addition to interviews, participant observation, survey data and informal conversation also provided background information for these topics. Here, women were well represented, although ideally perhaps these sources would be less anonymous and more prominently acknowledged. I would especially like to thank Ann Davis and Pam Ablowaluk, who cooked most of the food I ate during my fieldwork in summer 2016 and spring 2018, respectively. Lilly Ongtowasruk, Bonnie Scheele, Allison Johnson and Lulu Menadelook also contributed significantly to my understanding of this topic.

5.3.2 Human-*Rangifer* relations and animal agency

One of the research questions I have sought to address in this thesis asks, *What are the general patterns of interaction between humans, reindeer and caribou, and how have these developed over time*? A facet of human-*Rangifer* relations that I did not explore in this thesis is that of animal agency and its cultural construction. This topic is one that I feel warrants further exploration, particularly in light of some of my arguments on reindeer commodification. I have not discussed it in detail because I did not actively collect data on it; however, the ideas discussed in this thesis provide opportunity for speculation and future research.

Northern Indigenous conceptualizations of ecology commonly emphasize the importance of respect and relational accountability between humans and nonhuman beings such as animals. St. Lawrence Island Yupik herder Herman Toolie, of Savoonga, explains how his father taught him how to interact with reindeer:

> He always tell me never to get mad at the reindeer. When you're pushing the reindeer, never get mad at it. Reindeers got mind. If you get mad at the reindeer, they gonna scatter

> all over. And that's what they do to some people. They do—when they just, go after the reindeer, that reindeer will scatter. There are some people that reindeer don't like. There are some people that they really like (Toolie 2003).

Iñupiaq herder Johnson Stalker (2001) of Buckland, seems to similarly imply that reindeer have agency when he describes the process of taming draught reindeer: "Tie them. Play with them. Sometimes get mad at the reindeer, cause they so hard to handle. And they, they know it, but they try to win, too." Toolie's and Stalker's comments resonate with common themes of animal agency in ethnographic literature on the Circumpolar North, including among the Bering Straits Iñupiat (e.g. Raymond-Youkobian and Angnaboogok 2017) and among reindeer herding cultures (e.g., Beach and Stammler 2006). Indeed, intentionality in Indigenous cosmologies commonly extends beyond animals to plants, landscapes, environmental processes, etc. Anderson (2000, 116) construes the worldview of Evenki reindeer herders as based on a "sentient ecology" in which "hunters act and move on the tundra in such a way that they are conscious that animals and the tundra itself are reacting to them." Stammler (2006, 83-91) offers a similar interpretation of "the law of the tundra" that he encountered during his fieldwork among Yamal Nenets reindeer herders.

Nyssönen (2017, 135) argues that animal agency cannot be properly understood through constructs that humans have created to describe our own agency: "The 'meaning' and 'intention' of animal communication and reactions are on the far side of communicative and cross-cultural barriers, ultimately a matter of speculation and a source for misinterpreting." He goes on to suggest that animals do not understand abstract symbol-based systems that are unique to humans:

> Non-humans have no understanding of abstract constructs and structures surrounding and limiting their lives, such as the capitalist food market, game administration, etc. The non-humans meet these limits when they are enforced by humans, and then they can engage in context-specific action, for example resistance (Nyssönen 2017, 136).

In other words, because much of culture is based on abstract, human-specific conceptualizations, non-human animals do not have sufficient understanding of its content to deliberately influence its operation. Yet insofar as cultural processes result in specific patterns of human action directed at or affecting nonhuman animals, they interact with humans on the basis of these actions. While these actions are certainly *social*, they are not mediated through the sets of symbols (e.g. language) that humans use among each other.

I should note that Nyssönen's interpretation apparently differs from that inherent in many traditional Indigenous cosmologies, in which humans often communicate with animal spirits via (symbolic) rituals (Ingold 1987; Kassam 2009). While these practices are symbolic, they are also embodied. For example, one seal hunter I know from Nome has mentioned cutting seals' eyes after hunting them and giving each of them a final drink of water.[74] This involves direct, tactile engagement with the deceased animal. Other rituals and proscriptions are sometimes less direct, but they typically involve some form of physical action that is done with analogous intent. I interpret some Indigenous critiques of colonial institutions such as modern game management regimes (e.g. Merculieff 1994) as being rooted in their abstracted and disembodied nature.

[74] I saw herders in another community give a reindeer a drink of water just after they had shot it, as described in chapter 1, p. 12. However, I have asked a few Nome-Teller area Iñupiaq hunters and/or elders about this custom, and none have said they do this with land mammals in contemporary times.

Yet while human operation within symbolic domains like game management may be relatively disembodied, it certainly creates ecological and tactile realities, as Nyssönen points out in the above-quoted passage. Most significantly, "surrounding and limiting" animals' lives has the practical effect of curbing their ability to actually exercise agency. In a chapter published in the same volume as Nyssönen's, Raymond-Youkobian and Angnaboogok (2017) show that human-fish relationships have undergone massive changes among Indigenous inhabitants of the Bering Straits region. Fish were traditionally regarded as sentient and autonomous, but during the past century, views have shifted, and today they are generally regarded as not particularly intelligent or agentive. Raymond-Youkobian and Angnaboogok (2017, 107) attribute this change to "(1) the Western rationalization of the local conceptualization of fish, (2) the commodification of fish (particularly through the introduction of commercial fishing), and (3) the Christianization of the conceptualization of fish and human-fish relationships." They note that this cosmological shift has not been so dramatic for land mammals, which have still retained some of their agency.

A worthwhile topic for further research in this area would be on whether there are any relationships between intensive reindeer commodification, on the one hand, and changing or differing perceptions of reindeer's agency and intelligence on the other. As we have seen, reindeer herding involves different human-animal relationships than those inherent in *Rangifer* hunting (Ingold 2000; Knight 2012; Donahoe 2012). Moreover, Ellanna and Sherrod (2004) have suggested that in early 20th century Iñupiaq cosmology, reindeer were believed to have given up some of their autonomy by becoming tame. Yet the circumstances under which animals are subject to monetary exchange relates directly to the "abstract constructs and structures surrounding and limiting their lives" (Nyssönen 136). Anderson (2000, 119-125) explains the concept of "knowing" that he encountered among the Evenki as context-specific knowledge that,

by its nature, could not be delineated. Evenki herders "know" which reindeer to slaughter under particular circumstances. Yet modern methods of reindeer husbandry involve tracking animals and selecting particular ones for slaughter, castration, breeding, etc., on the basis of quantitative constructs (e.g. Zhigunov 1968). In cultures with long histories of reindeer herding, this has sometimes created dissonance with Indigenous values (Vitebsky 2005; Beach and Stammler 2006; Kerttula 2000). However, I have seen little indication of this in Alaska—on the contrary, herders seem to welcome science-based reindeer husbandry techniques. Nevertheless, Iñupiaq herders continue to emphasize traditional Iñupiaq values such as respect for the animals, thankfulness for their providence and non-wastefulness, so perhaps animal commodification has not had such effects on their view of reindeer. At any rate, the ongoing, cross-cultural construction of animal agency in reindeer herding is worthy of further study.

5.4 Conclusion

This thesis has sought to answer the following questions, as stated in chapter 1:

- What is the role of reindeer within communities of the southwestern Seward Peninsula, particularly as a food source?
    a. What are the general patterns of interaction between humans, reindeer and caribou, and how have these developed over time??
    b. How are reindeer constructed as a wild/domestic animal within local communities?
    c. What are the general patterns of acquisition, exchange and use of reindeer products?

d. How does the social role of reindeer as a food source compare to that of caribou and other wild food sources?

e. How have changing relationships to food in rural Alaska influenced the way reindeer herding is conceptualized?

While the list of responding arguments I have presented in 1.1.1 provides a succinct set of generalizations, I have shown that there is considerable nuance and complexity surrounding each of these issues. Because several of these questions refer to issues that are actively developing, a more definitive set of statements would likely be possible only in historical perspective. This is particularly true of question e. While I have provided some speculation on this topic, such as in 5.1.2, I believe a variety of outcomes are possible in terms of the relationship between changing food systems and reindeer herding.

Reindeer cannot be understood as "wild" or "domestic" without understanding the particular human relationships surrounding the animals. More generally, descriptive labels such as "wild," "domestic," "hunting" and "herding," do not convey the nuance and flexibility inherent in the animal populations and their relationships to humans. Just the same, these concepts sometimes do carry immense social weight, as they signify what may be done with the animals and their products. Herders ensure the persistence of reindeer herding by distinguishing their animals from caribou, both in symbolic and tactile domains. This involves expense and effort, without which human-reindeer relationships tend to default back to their more generalized mode—hunting. Because the modern Seward Peninsula is not separate from the globalized economy, these costs mean that active herders typically must seek monetary opportunities in order for their herds to be economically sustainable. On the other hand, local interest in herding

has also related to the fact that reindeer, and their products, are understood as local and as somewhat rooted in the area. Yet because reindeer products are very similar to the caribou products that are typically obtained without direct monetary exchange, opportunity for caribou hunting decreases willingness to pay for reindeer products among some locals.

Community involvement in reindeer herding activities often serves to broaden cultural investment in the activity. MSRR's Reindeer Youth Summit events worked toward creating an association between positive community experiences and reindeer as food. Roundups have played a similar role historically and at other herds, and many Teller residents spoke of missing them in recent years. RHA director Rose Fosdick (2016) has said:

> It's a real community event when they do have handlings. In most communities, not all. The little villages are the prime example of, if you go to their corral and they're handling reindeer, you'll see most of the community there. And they're helping. Little things, big things—you know, they're helping. And then, um, mostly their payment—if they're helping in a big way—is to get reindeer meat and take it home. It's like a good, preferred meat. Fresh meat. Quality. So yeah, there's hope. They hope. […] And I hope for them.

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Appendix A: Abbreviations, colloquial terms and local names

ADF&G	Alaska Department of Fish & Game
ADF&G Subsistence	Alaska Department of Fish & Game, Division of Subsistence
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
ARC	Alaska Reindeer Council
Bering Straits region	Here, the part of Alaska coinciding with the Nome Census area, encompassing the communities from Stebbins and St. Michael in the South, to Shishmaref in the North. This designation includes most of the Seward Peninsula, except its Northeastern portion, where the communities of Deering and Buckland are located.
BIA	Bureau of Indian Affairs
BLM	US Bureau of Land Management
BSNC	Bering Straits Native Corporation
Butchering	Killing reindeer, whether through highly controlled slaughter at a corral or hunting in the open tundra. In Teller, particularly, I have observed that this term is colloquially used for all reindeer harvest.

GMU	Game Management Unit, a regulatory division used by the Alaska Department of Fish & Game.
GRYS	Global Reindeer Youth Summit (shortened to Reindeer Youth Summit in 2017); a recurring event held at the Midnite Sun Reindeer Ranch in 2016, 2017 and 2019.
HLRM	High Latitude Range Management program
IRA	Indian Reorganization Act: here, a model of organization followed by some Alaska Native tribal governments.
Kawerak	Kawerak, Inc., the regional nonprofit Alaska Native Corporation for the Bering Straits region.
MSRR	Midnite Sun Reindeer Ranch; name of the business associated with the Davis reindeer herd.
NANA	NANA, Inc., the regional Alaska Native Corporation for the Northwest Arctic region
NEC	Nome Eskimo Community, a federally-recognized Alaska Native tribe based in Nome.
NPS	National Parks Service
NSEDC	Norton Sound Economic Development Corporation

NVMI	Native Village of Mary's Igloo, a federally-recognized Alaska Native tribe based in Teller.
RHA	Reindeer Herders' Association; an organization within Kawerak, Inc., which provides political and economic representation to reindeer herders.
RRP	University of Alaska Fairbanks Reindeer Research Program
RYS	Reindeer Youth Summit (originally called Global Reindeer Youth Summit in 2016); a recurring event held at the Midnite Sun Reindeer Ranch in 2016, 2017 and 2019.
Selling tags	A colloquial term for a kind of transaction in which a reindeer owner sell a written permit signifying permission to harvest a reindeer from that owner's herd. Sometimes called selling permits.
Sitnasuak	The village-level Alaska Native Corporation for Nome.
Snowmachine	A colloquial term for snowmobile generally used throughout Alaska.
SPH	Seward Peninsula Caribou Herd, a historic caribou herd postulated by Burch (2012), which disappeared in the mid-19th century.
TC	Traditional Council

TP	Technical Paper, referring to an ongoing series of publications from the Alaska Department of Fish & Game, Subsistence Division
Tri-party herd	A reindeer herd based in Stebbins and St. Michael that is jointly owned by the Stebbins IRA, St. Michael IRA, and private owner Ted Katcheak.
UAF	University of Alaska Fairbanks
USDA	United States Department of Agriculture;
USFWS	US Fish and Wildlife Service
WAH	Western Arctic Caribou Herd

Appendix B: Ethnographic interview key respondents

Tanya Ablowaluk
Michelle Adams
Austin Ahmasuk
Roy Ashenfelter
Rob Bensin
Bruce Davis
Bill Dunker
Greg Finstad
Rose Fosdick
Tom Gray
Jackie Hrabok-Leppäjärvi
Pearl Johnson
Julie Lee
Cheryl Lynch
Jimmy Noyakuk
Charles Okbaok
Jerry Okbaok
Jimmy Pushruk
Bonnie Scheele
Elmer Seetot, Jr.
Carlson Tingook

Appendix C: Survey Protocol

Teller Survey Instrument

Date: _____

Random household ID Number: _____

Informed consent completed (check) ____

Filter questions

1. Do you live in this household? Y N

2. During the past year, have you lived in Teller for at least six months? Y N

A. Demographic questions

A.1 What is your gender? _____

A.2 What year were you born? _____

A.3 Are you a member of a federally-recognized tribe? Y N

A.3.1 If so, which one? _____

A.4 How many people live in your household? _____

A.5 What are the ages of the oldest and youngest members of your household?

Oldest: _____ Youngest: _____

A.6 Would you describe members of your household as:

a.) Mainly Alaska native

b.) A mixture of both native and nonnative

c.) Mainly nonnative

A.7 How long have members of your household lived in Teller?

A.8 How long have members of your household lived in this part of Alaska?

B. Reindeer

B.1 During the past 15 years, has anyone in your household:

B.1.1 Worked **in** Alaska's reindeer industry? Y N

B.1.2 If YES, please describe

_____

B.1.3 Worked directly **with** Alaska's reindeer industry, such as through a tribe or agency job? Y N

B.1.4 If YES, please describe

_____

B.1.5 Volunteered or participated in multiple herding activities over the course of two or more years? Y N

B.1.6 If YES, please describe

_____

B.2 During the past year, did anyone in your household eat commercially-produced reindeer sausages? Y N

B.2.1 If YES, how many times per month, on average?

_____

B.3 During the past year, did your household use any other kind of reindeer meat or other reindeer products? Y N

If no, skip to question B.4.

B.3.1 If YES, please estimate the amount of reindeer meat that you: (All reindeer products except the sausages)

Bought: _____ Where from: _____

How much per pound? _____

Traded for: _____Where from: _____

Received: _____Where from: _____

Harvested: _____ Where from: _____

B.3.2 During the past year, has anyone in your household used any non-meat reindeer products, such as hides, antlers, etc?

Y N

B.3.2.1 If YES, please describe your use:

_____

_____

B.4 During the past 20 years, has your household normally used reindeer meat or other reindeer products? Y | N

B.4.1 What about during the past five years? Y | N

B.4.2 If YES to either of these, please describe your use and whether it's changed in recent years:

_____

_____

_____

_____

B.5 During the period of time you have lived in this region, which do you feel has been the most important role of reindeer herding?

a.) Part of region's culture/tradition

b.) Economic driver/opportunity

c.) Food source/food security

d.) Other (describe)

_____

B.6 On a scale of 1 to 10, how would you rank the importance of **reindeer herding** to this region, with 1 being "not important at all" and 10 being "extremely important"?

1 2 3 4 5 6 7 8 9 10

B.7 On average, how many meals per week do you eat that include store-bought dark meats, such as beef? _____

B.8 Imagine that local reindeer meat were always available at the grocery store and cost the same as beef. Would you replace any of your store-bought meat with reindeer? If so, how much? (circle one)

None Only a little bit About half Most of it All of it

B.8.1 If local reindeer meat were always available, and cost $13 per pound, would you replace any of your store-bought meat with reindeer? If so, how much? (circle one)

None Only a little bit About half Most of it All of it

B.8.2 If local reindeer meat were always available, and cost $18 per pound, would you replace any of your store-bought meat with reindeer? If so, how much?

None Only a little bit About half Most of it All of it

B.9 Do you have any comments or thoughts about the significance of reindeer herding and reindeer products to this area?

C. Large land mammals

C.1 Please indicate **which of the following large land mammals members of your household have eaten** during the **past year**. Please rank these cards [shown in Appendix A at the end of the document] in order, starting with the ones that members of your household **ate the most** of during the past year, and moving toward those they **ate the least** of during the past year.
a.) caribou b.) reindeer c.) moose d.) musk-ox e.) brown bear f.) other (describe)

C.2 Please rank the following kinds of large land mammals, starting with the ones that members of your household **value and/or prefer** most, and moving toward those they value and/or prefer least:
a.) caribou b.) reindeer c.) moose d.) musk-ox e.) brown bear f.) other (describe)

C.3 Which of these do members of your household **usually hunt for**?

C.4 Did anyone in your household **shoot** any of these during the past year? Y N

C.4.1 If so, which ones?

If respondent did not mention caribou in C.4.1, skip to question C.5

C.4.1.1 How many caribou did your household catch? Where? What month of the year?

C.4.1.2 Was this year's caribou hunting normal for your household?

C.5 Do you often see reindeer out in the country? If so, how do you tell them apart from caribou?

C.6 On a scale of 1 to 10, how would you rank the importance of **caribou hunting** to this region, with 1 being "not important at all" and 10 being "extremely important"?

1 2 3 4 5 6 7 8 9 10

D. Subsistence and local food

D.1 How would you define "subsistence"?

_____

_____

_____

_____

D.2 If these boxes below represent all the food your household used last year, could you please indicate how much of it came from wild or local food sources?

D.3 Please indicate which of the following kinds of **local food members of your household have eaten** during the past year. Please rank these cards in order, starting with the ones that members of your **household ate the most of** during the past year, and moving toward those they **ate the least of** during the past year: a.) fish b.) shellfish c.) large land mammals d.) domestic reindeer e.) small land mammals f.) marine mammals g.) birds h.) bird eggs i.) berries j.) other wild plants k.) garden products l.) other (describe).

Photo: _____ Missing: _____

D.4 Please rank the following kinds of local food, starting with the ones that members of your household **value and/or prefer** most, and moving toward those they value and/or prefer least: a.) fish b.) shellfish c.) large land mammals d.) domestic reindeer e.) small land mammals f.) marine mammals g.) birds h.) bird eggs i.) berries j.) other wild plants k.) garden products l.) other (describe).

Photo: _____ Missing: _____

D.5 Please rank the following kinds of local food, starting with the ones that are being most heavily **impacted by changes in the environment**, and moving toward those that are being least impacted by changes in the environment: a.) fish b.) shellfish c.) large land mammals d.) domestic reindeer e.) small land mammals f.) marine mammals g.) birds h.) bird eggs i.) berries j.) other wild plants k.) garden products l.) other (describe).

Photo: _____ Missing: _____

D.6 What are some of the biggest changes you have seen that have affected subsistence in this area during the past ten or fifteen years?

D.7 Do you have any comments or thoughts about the significance of subsistence foods to this area's culture, economy or food security?

D.8 Do you grow any of your own food—for example do you have your own garden, chickens, etc. If so, what kinds of food and how much to you normally produce? (describe)

Do you have any comments, questions or concerns?

Surveyor notes:

Appendix D : IRB approval document

(907) 474-7800
(907) 474-5444 fax
uaf-irb@alaska.edu
www.uaf.edu/irb

Institutional Review Board

909 N Koyukuk Dr. Suite 212, P.O. Box 757270, Fairbanks, Alaska 99775-7270

May 23, 2016

To:	Patrick Plattet Principal Investigator
From:	University of Alaska Fairbanks IRB
Re:	[206877-2] Reindeer Herding Food Systems and Adaptive Capacity on Seward Peninsula

Thank you for submitting the New Project referenced below. The submission was handled by Exempt Review. The Office of Research Integrity has determined that the proposed research qualifies for exemption from the requirements of 45 CFR 46. This exemption does not waive the researchers' responsibility to adhere to basic ethical principles for the responsible conduct of research and discipline specific professional standards.

Title:	Reindeer Herding Food Systems and Adaptive Capacity on Seward Peninsula
Received:	May 23, 2016
Exemption Category:	2
Effective Date:	May 23, 2016

This action is included on the June 8, 2016 IRB Agenda.

Prior to making substantive changes to the scope of research, research tools, or personnel involved on the project, please contact the Office of Research Integrity to determine whether or not additional review is required. Additional review is not required for small editorial changes to improve the clarity or readability of the research tools or other documents.

Appendix E: Survey consent script

Consent Script

Reindeer Herding, Food Systems and Adaptive Capacity on Seward Peninsula, Alaska

IRB # 906877-2
Date approved: 23 May 2016

Description of the study:
My name is Odin Miller. I am from the University of Alaska Fairbanks (UAF) Department of Anthropology. I am asking you to participate in an oral survey as part of a study on reindeer herding, subsistence, and food in the Nome/Seward Peninsula area. I have chosen a random selection of Nome households to ask to take this survey. My goals are:

1) To understand reindeer herding, caribou hunting and the role these animals play as traditional foods on the Seward Peninsula.
2) To get an idea of how people use different kinds of food, including subsistence foods, reindeer foods, and store foods.
3) To explore how changes in the environment are affecting reindeer herding, caribou hunting and other local food systems.

If you agree to complete this survey I will ask you some questions about how your household uses reindeer products and other local foods. If you choose to participate in this survey, you will spend between five minutes and one hour answering questions on these topics. I expect that most surveys will take about 20 minutes to complete.

Risks and Benefits of Being in the Study:
If you take part in this study, the risks to you are minimal. If you are not comfortable with a survey question, you do not need to answer. You may end a survey at any time, for any reason. Anything you tell us will be used only for research purposes. This survey will remain anonymous and confidential.

The benefits to you are that you will be helping to document knowledge about reindeer herding, subsistence and other food issues in Northwest Alaska. This information could be valuable to tribes and local governments. It could also be valuable to others who are interested in reindeer herding and/or local food.

Confidentiality:
Survey forms will be completely anonymous and confidential. I will not use any data from your responses if it may be used to identify you.

I will use surveys for my research. I may also share them with research partners while I am working with them on this project. If I do so, I will make sure that they agree to the same ethical guidelines that I have agreed to. Otherwise, I will keep the survey forms confidential. I will compile and review survey data, and use some of this in reports, presentations and publications.

Voluntary nature of the study:
You are free to choose whether or not to take part in this survey. If you decide to take part in this survey you can stop at any time or change your mind. If you do so, you can tell me not to use your information in this study.

Oral informed consent:
Do you agree to participate in this survey?

____Yes

____No

By agreeing to take this survey, you consent to this form.

Contacts and questions:
If you have questions now, feel free to ask me now. If you have questions later, you may contact me at any time:

Odin Miller / MA Student / Department of Anthropology / University of Alaska Fairbanks / PO Box 99775-7720 / 907-303-5000 / odinwm@gmail.com

You may contact my supervisor at:
Patrick Plattet / Associate Professor / Department of Anthropology / University of Alaska Fairbanks / PO Box 99775-7720 / Fairbanks, AK 99775-7720 / 907-474-6608 / pplattet@alaska.edu

The UAF Institutional Review Board (IRB) is a group that examines research projects involving people. They do reviews of these projects to protect people like you who are involved in the research. If you have questions or concerns about your rights as a research participant, you can contact the UAF Office of Research Integrity at 474-7800 (Fairbanks area) or 1-866-876-7800 (toll-free outside the Fairbanks area) or uaf-irb@alaska.edu

Appendix F: Key respondent interview consent form

Informed Consent

Reindeer Herding, Food Systems and Adaptive Capacity on Seward Peninsula, Alaska

IRB # 906877-2
Date approved: 23 May 2016

Description of the study:
My name is Odin Miller. I am from the University of Alaska Fairbanks (UAF) Department of Anthropology. I am asking you to take part in a study on reindeer herding, subsistence, and food in the Nome/Seward Peninsula area. My goals are:

1) To understand reindeer herding and how it plays a role as one of the foods people eat on the Seward Peninsula.
2) To get an idea of how people use different kinds of food, including subsistence foods, reindeer foods, and store foods.
3) To explore the role reindeer herding could play in helping to adapt to changes in the environment.

If you agree to participate I will ask you to share some of what you know about subsistence and/or reindeer herding. If you choose to do an interview you may spend between 30 minutes and 3 hours talking with me.

Risks and Benefits of Being in the Study:
If you take part in this study, the risks to you are minimal. If you are not comfortable with an interview question or with anything we are talking about, you do not need to answer. You may end an interview at any time, for any reason. Anything you tell us will be used only for research purposes.

The benefits to you are that you will be helping to document knowledge about reindeer herding, subsistence and other food issues in Northwest Alaska. This information could be valuable to tribes and local governments. It could also be valuable to others who are interested in reindeer herding and/or local food.

Compensation:
You will receive $50 for an interview, within budget limitations.

Confidentiality:
We will keep all interviews, pictures, films, surveys and maps created for this project at the UAF Department of Anthropology during the life of this project. If you like, we can give you copies of your interview(s) and any reports where we use knowledge from your interview.

We will use recordings, transcripts, surveys, maps for our research. We may also share them with research partners while we are working with them on this project. If we do so, we will make sure that they agree to the same ethical guidelines that we have agreed to. Otherwise, we will keep the recordings, transcripts and other such information confidential. We will compile and review

information you give us, and use some of this in reports, presentations and publications. We will not use your name unless you sign below that it is OK.

Please check one of these:

____ It is OK to use my name in my reports/presentations/publications

____ Do not use my name in in reports/presentations/publications

Voluntary nature of the study:
You are free to choose whether or not to take part in this study. If you decide to take part in this study you can stop at any time or change your mind. If you do so, you can tell us not to use your information in this study. If you decide you do not want to be part of the study you will still be paid the $50 for your time as long as you have completed at least 20 minutes of the interview.

Contacts and Questions:
If you have questions now, feel free to ask me now. If you have questions later, you may contact me at any time:

Odin Miller / MA Student / Department of Anthropology / University of Alaska Fairbanks / PO Box 99775-7720 / 907-303-5000 / odinwm@gmail.com

You may contact my supervisor at:
Patrick Plattet / Associate Professor / Department of Anthropology / University of Alaska Fairbanks / PO Box 99775-7720 / Fairbanks, AK 99775-7720 / 907-474-6608 / pplattet@alaska.edu

The UAF Institutional Review Board (IRB) is a group that examines research projects involving people. They do reviews of these projects to protect people like you who are involved in the research. If you have questions or concerns about your rights as a research participant, you can contact the UAF Office of Research Integrity at 474-7800 (Fairbanks area) or 1-866-876-7800 (toll-free outside the Fairbanks area) or uaf-irb@alaska.edu

Statement of Consent:
I understand the procedures described above and my questions have been answered as needed. I agree to take part in this study. I have been given a copy of this form.

Signature of participant Date

Signature of person asking for consent Date